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ECONOMIC COMMISSION FOR EUROPE

Committee on Inland Transport

**European Agreement concerning the International Carriage
of Dangerous Goods by Inland Waterways
(ADN)**

including the Annexed Regulations, applicable as from
28 February 2009

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**EUROPEAN AGREEMENT CONCERNING THE
INTERNATIONAL CARRIAGE OF DANGEROUS GOODS
BY INLAND WATERWAYS (ADN)**

THE CONTRACTING PARTIES,

DESIRING to establish by joint agreement uniform principles and rules, for the purposes of:

- (a) increasing the safety of international carriage of dangerous goods by inland waterways;
- (b) contributing effectively to the protection of the environment, by preventing any pollution resulting from accidents or incidents during such carriage; and
- (c) facilitating transport operations and promoting international trade,

CONSIDERING that the best means of achieving this goal is to conclude an agreement to replace the „European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterways“ annexed to resolution No. 223 of the Inland Transport Committee of the Economic Commission for Europe, as amended,

HAVE AGREED as follows:

**CHAPTER I
GENERAL PROVISIONS**

Article 1
Scope

1. This Agreement shall apply to the international carriage of dangerous goods by vessels on inland waterways.

2. This Agreement shall not apply to the carriage of dangerous goods by seagoing vessels on maritime waterways forming part of inland waterways.

3. This Agreement shall not apply to the carriage of dangerous goods by warships or auxiliary warships or to other vessels belonging to or operated by a State, provided such vessels are used by the State exclusively for governmental and non-commercial purposes. However, each Contracting Party shall, by taking appropriate measures which do not impair the operations or operational capacity of such vessels belonging to or operated by it, ensure that such vessels are operated in a manner compatible with this Agreement, where it is reasonable in practice to do so.

Article 2
Regulations annexed to the Agreement

1. The Regulations annexed to this Agreement shall form an integral part thereof. Any reference to this Agreement implies at the same time a reference to the Regulations annexed thereto.

2. The annexed Regulations include:
- a) Provisions concerning the international carriage of dangerous goods by inland waterways;
 - b) Requirements and procedures concerning inspections, the issue of certificates of approval, recogni-

tion of classification societies, derogations, special authorizations, monitoring, training and examination of experts;

- c) General transitional provisions;
- d) Supplementary transitional provisions applicable to specific inland waterways.

Article 3
Definitions

For the purposes of this Agreement:

- a) "*vessel*" means an inland waterway or seagoing vessel;
- b) "*dangerous goods*" means substances and articles the international carriage of which is prohibited by, or authorized only on certain conditions by, the annexed Regulations;
- c) "*international carriage of dangerous goods*" means any carriage of dangerous goods performed by a vessel on inland waterways on the territory of at least two Contracting Parties;
- d) "*inland waterways*" means the navigable inland waterways including maritime waterways on the territory of a Contracting Party open to the navigation of vessels under national law;
- e) "*maritime waterways*" means inland waterways linked to the sea, basically used for the traffic of seagoing vessels and designated as such under national law;
- f) "*recognized classification society*" means a classification society which is in conformity with the annexed Regulations and recognized, in accordance with the procedures laid down in these Regulations, by the competent authority of the Contracting Party where the certificate is issued;
- g) "*competent authority*" means the authority or the body designated or recognized as such in each Contracting Party and in each specific case in connection with these provisions;
- h) "*inspection body*" means a body nominated or recognized by the Contracting Party for the purpose of inspecting vessels according to the procedures laid down in the annexed Regulations.

**CHAPTER II
TECHNICAL PROVISIONS**

Article 4
Prohibitions on carriage, conditions of carriage,
monitoring

1. Subject to the provisions of Articles 7 and 8, dangerous goods barred from carriage by the annexed Regulations shall not be accepted for international carriage.

2. Without prejudice to the provisions of Article 6, the international carriage of other dangerous goods

shall be authorized, subject to compliance with the conditions laid down in the annexed Regulations.

3. Observance of the prohibitions and the conditions referred to in paragraphs 1 and 2 shall be monitored by the Contracting Parties in accordance with the provisions laid down in the annexed Regulations.

Article 5 Exemptions

This Agreement shall not apply to the carriage of dangerous goods to the extent to which such carriage is exempted in accordance with the annexed Regulations. Exemptions may only be granted when the quantity of the goods exempted, or the nature of the transport operation exempted, or the packagings, ensure that transport is carried out safely.

Article 6 Sovereign right of States

Each Contracting Party shall retain the right to regulate or prohibit the entry of dangerous goods into its territory for reasons other than safety during carriage.

Article 7 Special regulations, derogations

1. The Contracting Parties shall retain the right to arrange, for a limited period established in the annexed Regulations, by special bilateral or multilateral agreements, and provided safety is not impaired:

- a) that the dangerous goods which under this Agreement are barred from international carriage may, subject to certain conditions, be accepted for international carriage on their inland waterways; or
- b) that dangerous goods which under this Agreement are accepted for international carriage only on specified conditions may alternatively be accepted for international carriage on their inland waterways under conditions different from those laid down in the annexed Regulations.

The special bilateral or multilateral agreements referred to in this paragraph shall be communicated immediately to the Executive Secretary of the Economic Commission for Europe, who shall communicate them to the Contracting Parties which are not signatories to the said agreements.

2. Each Contracting Party shall retain the right to issue special authorizations for the international carriage in tank vessels of dangerous substances the carriage of which in tank vessels is not permitted under the provisions concerning carriage in the annexed Regulations, subject to compliance with the procedures relating to special authorizations in the annexed Regulations.

3. The Contracting Parties shall retain the right to authorize, in the following cases, the international carriage of dangerous goods on board vessels which do not comply with conditions established in the annexed Re-

gulations, provided that the procedure established in the annexed Regulations is complied with:

- a) The use on a vessel of materials, installations or equipment or the application on a vessel of certain measures concerning construction or certain provisions other than those prescribed in the annexed Regulations;
- b) Vessel with technical innovations derogating from the provisions of the annexed Regulations.

Article 8 Transitional provisions

1. Certificates of approval and other documents prepared in accordance with the requirements of the Regulations for the Carriage of Dangerous Goods in the Rhine (ADNR), the Regulations for the Carriage of Dangerous Goods on the Danube (ADN-D) or national regulations based on the European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterways as annexed to resolution No. 223 of the Inland Transport Committee of the Economic Commission for Europe or as amended, applicable at the date of application of the annexed Regulations foreseen in Article 11, paragraph 1, shall remain valid until their expiry date, under the same conditions as those prevailing up to the date of such application, including their recognition by other States. In addition, these certificates shall remain valid for a period of one year from the date of application of the annexed Regulations in the event that they would expire during that period. However, the period of validity shall in no case exceed five years beyond the date of application of the annexed Regulations.

2. Vessels which, at the date of application of the annexed Regulations foreseen in Article 11, paragraph 1, are approved for the carriage of dangerous goods on the territory of a Contracting Party and which conform to the requirements of the annexed Regulations, taking into account where necessary, their general transitional provisions, may obtain an ADN certificate of approval under the procedure laid down in the annexed Regulations.

3. In the case of vessels referred to in paragraph 2 to be used exclusively for carriage on inland waterways where ADNR was not applicable under domestic law prior to the date of application of the annexed Regulations foreseen in Article 11, paragraph 1, the supplementary transitional provisions applicable to specific inland waterways may be applied in addition to the general transitional provisions. Such vessels shall obtain an ADN certificate of approval limited to the inland waterways referred to above, or to a portion thereof.

4. If new provisions are added to the annexed Regulations, the Contracting Parties may include new general transitional provisions. These transitional provisions shall indicate the vessels in question and the period for which they are valid.

Article 9
Applicability of other regulations

The transport operations to which this Agreement applies shall remain subject to local, regional or international regulations applicable in general to the carriage of goods by inland waterways.

CHAPTER III
FINAL PROVISIONS

Article 10
Contracting Parties

1. Member States of the Economic Commission for Europe whose territory contains inland waterways, other than those forming a coastal route, which form part of the network of inland waterways of international importance as defined in the European Agreement on Main Inland Waterways of International Importance (AGN) may become Contracting Parties to this Agreement:

- a) by signing it definitively;
- b) by depositing an instrument of ratification, acceptance or approval after signing it subject to ratification, acceptance or approval;
- c) by depositing an instrument of accession.

2. The Agreement shall be open for signature until 31 May 2001 at the Office of the Executive Secretary of the Economic Commission for Europe, Geneva. Thereafter, it shall be open for accession.

3. The instruments of ratification, acceptance, approval or accession shall be deposited with the Secretary-General of the United Nations.

Article 11
Entry into force

1. This Agreement shall enter into force one month after the date on which the number of States mentioned in Article 10, paragraph 1, which have signed it definitively, or have deposited their instruments of ratification, acceptance, approval or accession has reached a total of seven.

However, the annexed Regulations, except provisions concerning recognition of classification societies, shall not apply until twelve months after the entry into force of the Agreement.

2. For any State signing this Agreement definitively or ratifying, accepting, approving or acceding to it after seven of the States referred to in Article 10, paragraph 1, have signed it definitively or have deposited their instruments of ratification, acceptance, approval or accession, this Agreement shall enter into force one month after the said State has signed it definitively or has deposited its instrument of ratification, acceptance, approval or accession.

The annexed Regulations shall become applicable on the same date. In the event that the term referred to in paragraph 1 relating to the application of the annexed

Regulations has not expired, the annexed Regulations shall become applicable after expiry of the said term.

Article 12
Denunciation

1. Any Contracting Party may denounce this Agreement by so notifying in writing the Secretary-General of the United Nations.

2. Denunciation shall take effect twelve months after the date of receipt by the Secretary-General of the written notification of denunciation.

Article 13
Termination

1. If, after the entry into force of this Agreement, the number of Contracting Parties is less than five during twelve consecutive months, this Agreement shall cease to have effect at the end of the said period of twelve months.

2. In the event of the conclusion of a world-wide agreement for the regulation of the multimodal transport of dangerous goods, any provision of this Agreement, with the exception of those pertaining exclusively to inland waterways, the construction and equipment of vessels, carriage in bulk or tankers which is contrary to any provision of the said world-wide agreement shall, from the date on which the latter enters into force, automatically cease to apply to relations between the Parties to this Agreement which become parties to the world-wide agreement, and shall automatically be replaced by the relevant provision of the said world-wide agreement.

Article 14
Declarations

1. Any State may, at the time of signing this Agreement definitively or of depositing its instrument of ratification, acceptance, approval or accession or at any time thereafter, declare by written notification addressed to the Secretary-General of the United Nations that this Agreement shall extend to all or any of the territories for the international relations of which it is responsible. The Agreement shall extend to the territory or territories named in the notification one month after it is received by the Secretary-General.

2. Any State which has made a declaration under paragraph 1 of this article extending this Agreement to any territory for whose international relations it is responsible may denounce the Agreement in respect of the said territory in accordance with the provisions of Article 12.

3.
a) In addition, any State may, at the time of signing this Agreement definitively or of depositing its instrument of ratification, acceptance, approval or accession or at any time thereafter, declare by written notification addressed to the Secretary-General of the United Nations that this Agreement shall not extend

to certain inland waterways on its territory, provided that the waterways in question are not part of the network of inland waterways of international importance as defined in the AGN. If this declaration is made subsequent to the time when the State signs this Agreement definitively or when it deposits its instrument of ratification, acceptance, approval or accession, the Agreement shall cease to have effect on the inland waterways in question one month after this notification is received by the Secretary-General.

b) However, any State on whose territory there are inland waterways covered by AGN, and which are, at the date of adoption of this Agreement, subject to a mandatory regime under international law concerning the carriage of dangerous goods, may declare that the implementation of this Agreement on these waterways shall be subject to compliance with the procedures set out in the statutes of the said regime. Any declaration of this nature shall be made at the time of signing this Agreement definitively or of depositing its instrument of ratification, acceptance, approval or accession.

4. Any State which has made a declaration under paragraphs 3 (a) or 3 (b) of this article may subsequently declare by means of a written notification to the Secretary-General of the United Nations that this Agreement shall apply to all or part of its inland waterways covered by the declaration made under paragraphs 3 (a) or 3 (b). The Agreement shall apply to the inland waterways mentioned in the notification one month after it is received by the Secretary-General.

Article 15 Disputes

1. Any dispute between two or more Contracting Parties concerning the interpretation or application of this Agreement shall so far as possible be settled by negotiation between the Parties in dispute.

2. Any dispute which is not settled by direct negotiation may be referred by the Contracting Parties in dispute to the Administrative Committee which shall consider it and make recommendations for its settlement.

3. Any dispute which is not settled in accordance with paragraphs 1 or 2 shall be submitted to arbitration if any one of the Contracting Parties in dispute so requests and shall be referred accordingly to one or more arbitrators selected by agreement between the Parties in dispute. If within three months from the date of the request for arbitration the Parties in dispute are unable to agree on the selection of an arbitrator or arbitrators, any of those Parties may request the Secretary-General of the United Nations to nominate a single arbitrator to whom the dispute shall be referred for decision.

4. The decision of the arbitrator or arbitrators appointed under paragraph 3 of this article shall be binding on the Contracting Parties in dispute.

Article 16 Reservations

1. Any State may, at the time of signing this Agreement definitively or of depositing its instrument of ratification, acceptance, approval or accession, declare that it does not consider itself bound by Article 15. Other Contracting Parties shall not be bound by Article 15 in respect of any Contracting Party which has entered such a reservation.

2. Any Contracting State having entered a reservation as provided for in paragraph 1 of this article may at any time withdraw such reservation by notifying in writing the Secretary-General of the United Nations.

3. Reservations other than those provided for in this Agreement are not permitted.

Article 17 Administrative Committee

1. An Administrative Committee shall be established to consider the implementation of this Agreement, to consider any amendments proposed thereto and to consider measures to secure uniformity in the interpretation and application thereof.

2. The Contracting Parties shall be members of the Administrative Committee. The Committee may decide that the States referred to in Article 10, paragraph 1 of this Agreement which are not Contracting Parties, any other Member State of the Economic Commission for Europe or of the United Nations or representatives of international intergovernmental or non-governmental organizations may, for questions which interest them, attend the sessions of the Committee as observers.

3. The Secretary-General of the United Nations and the Secretary-General of the Central Commission for the Navigation of the Rhine shall provide the Administrative Committee with secretariat services.

4. The Administrative Committee shall, at the first session of the year, elect a Chairperson and a Vice-Chairperson.

5. The Executive Secretary of the Economic Commission for Europe shall convene the Administrative Committee annually, or at other intervals decided on by the Committee, and also at the request of at least five Contracting Parties.

6. A quorum consisting of not less than one half of the Contracting Parties shall be required for the purpose of taking decisions.

7. Proposals shall be put to the vote. Each Contracting Party represented at the session shall have one vote. The following rules shall apply:

- (a) Proposed amendments to the Agreement and decisions pertaining thereto shall be adopted in accordance with the provisions of Article 19, paragraph 2;
- (b) Proposed amendments to the annexed Regulations and decisions pertaining thereto shall be adopted in

accordance with the provisions of Article 20, paragraph 4;

- (c) Proposals and decisions relating to the recommendation of agreed classification societies, or to the withdrawal of such recommendation, shall be adopted in accordance with the procedure of the provisions of Article 20, paragraph 4;
- (d) Any proposal or decision other than those referred to in paragraphs (a) to (c) above shall be adopted by a majority of the Administrative Committee members present and voting.

8. The Administrative Committee may set up such working groups as it may deem necessary to assist it in carrying out its duties.

9. In the absence of relevant provisions in this Agreement, the Rules of Procedure of the Economic Commission for Europe shall be applicable unless the Administrative Committee decides otherwise.

Article 18 Safety Committee

A Safety Committee shall be established to consider all proposals for the amendment of the Regulations annexed to the Agreement, particularly as regards safety of navigation in relation to the construction, equipment and crews of vessels. The Safety Committee shall function within the framework of the activities of the bodies of the Economic Commission for Europe, of the Central Commission for the Navigation of the Rhine and of the Danube Commission which are competent in the transport of dangerous goods by inland waterways.

Article 19 Procedure for amending the Agreement, excluding the annexed Regulations

1. This Agreement, excluding its annexed Regulations, may be amended upon the proposal of a Contracting Party by the procedure specified in this article.

2. Any proposed amendment to this Agreement, excluding the annexed Regulations, shall be considered by the Administrative Committee. Any such amendment considered or prepared during the meeting of the Administrative Committee and adopted by it by a two-thirds majority of the members present and voting shall be communicated by the Secretary-General of the United Nations to the Contracting Parties for their acceptance.

3. Any proposed amendments communicated for acceptance in accordance with paragraph 2 shall come into force with respect to all Contracting Parties six months after the expiry of a period of twenty-four months following the date of communication of the proposed amendment if, during that period, no objection to the amendment in question has been communicated in writing to the Secretary-General of the United Nations by a Contracting Party.

Article 20

Procedure for amending the annexed Regulations

1. The annexed Regulations may be amended upon the proposal of a Contracting Party.

The Secretary-General of the United Nations may also propose amendments with a view to bringing the annexed Regulations into line with other international agreements concerning the transport of dangerous goods and the United Nations Recommendations on the Transport of Dangerous Goods, as well as amendments proposed by a subsidiary body of the Economic Commission for Europe with competence in the area of the transport of dangerous goods.

2. Any proposed amendment to the annexed Regulations shall in principle be submitted to the Safety Committee, which shall submit the draft amendments it adopts to the Administrative Committee.

3. At the specific request of a Contracting Party, or if the secretariat of the Administrative Committee considers it appropriate, amendments may also be proposed directly to the Administrative Committee. They shall be examined at a first session and if they are deemed to be acceptable, they shall be reviewed at the following session of the Committee at the same time as any related proposal, unless otherwise decided by the Committee.

4. Decisions on proposed amendments and proposed draft amendments submitted to the Administrative Committee in accordance with paragraphs 2 and 3 shall be made by a majority of the members present and voting. However, a draft amendment shall not be deemed adopted if, immediately after the vote, five members present declare their objection to it. Adopted draft amendments shall be communicated by the Secretary-General of the United Nations to the Contracting Parties for acceptance.

5. Any draft amendment to the annexed Regulations communicated for acceptance in accordance with paragraph 4 shall be deemed to be accepted unless, within three months from the date on which the Secretary-General circulates it, at least one-third of the Contracting Parties, or five of them if one-third exceeds that figure, have given the Secretary-General written notification of their objection to the proposed amendment. If the amendment is deemed to be accepted, it shall enter into force for all the Contracting Parties, on the expiry of a further period of three months, except in the following cases:

- (a) In cases where similar amendments to other international agreements governing the carriage of dangerous goods have already entered into force, or will enter into force at a different date, the Secretary-General may decide, upon written request by the Executive Secretary of the Economic Commission for Europe, that the amendment shall enter into force on the expiry of a different period so as to allow the simultaneous entry into force of these amendments with those to be made to such other agreements or, if not possible, the quickest entry

into force of this amendment after the entry into force of such amendments to other agreements; such period shall not, however, be of less than one month's duration.

- (b) The Administrative Committee may specify, when adopting a draft amendment, for the purpose of entry into force of the amendment, should it be accepted, a period of more than three months' duration.

Article 21

Requests, communications and objections

The Secretary General of the United Nations shall inform all Contracting Parties and all States referred to in Article 10, paragraph 1 of this Agreement of any request, communication or objection under Articles 19 and 20 above and of the date on which any amendment enters into force.

Article 22

Review conference

1. Notwithstanding the procedure provided for in Articles 19 and 20, any Contracting Party may, by notification in writing to the Secretary General of the United Nations, request that a conference be convened for the purpose of reviewing this Agreement.

A review conference to which all Contracting Parties and all States referred to in Article 10, paragraph 1, shall be invited, shall be convened by the Executive Secretary of the Economic Commission for Europe if, within a period of six months following the date of notification by the Secretary General, not less than one fourth of the Contracting Parties notify him of their concurrence with the request.

2. Notwithstanding the procedure provided for in Articles 19 and 20, a review conference to which all Contracting Parties and all States referred to in Article 10, paragraph 1, shall be invited, shall also be convened by the Executive Secretary of the Economic Commission

for Europe upon notification in writing by the Administrative Committee. The Administrative Committee shall make a request if agreed to by a majority of those present and voting in the Committee.

3. If a conference is convened in pursuance of paragraphs 1 or 2 of this article, the Executive Secretary of the Economic Commission for Europe shall invite the Contracting Parties to submit, within a period of three months, the proposals which they wish the conference to consider.

4. The Executive Secretary of the Economic Commission for Europe shall circulate to all the Contracting Parties and to all the States referred to in Article 10, paragraph 1, the provisional agenda for the conference, together with the texts of such proposals, at least six months before the date on which the conference is to meet.

Article 23

Depositary

The Secretary-General of the United Nations shall be the depositary of this Agreement.

IN WITNESS WHEREOF the undersigned, being duly authorized thereto, have signed this Agreement.

DONE at Geneva, this twenty-sixth day of May two thousand, in a single copy, in the English, French, German and Russian languages for the text of the Agreement proper, and in the French language for the annexed Regulations, each text being equally authentic for the Agreement proper.

The Secretary General of the United Nations is requested to prepare a translation of the annexed Regulations in the English and Russian languages.

The Secretary-General of the Central Commission for the Navigation of the Rhine is requested to prepare a translation of the annexed Regulations in the German language.

ANNEXED REGULATIONS

PART I

General provisions

CHAPTER 1.1**SCOPE AND APPLICABILITY****1.1.1 Structure**

The Regulations annexed to ADN are grouped into nine parts. Each part is subdivided into chapters and each chapter into sections and subsections (see table of contents). Within each part the number of the part is included with the numbers of the chapters, sections and subsections, for example Part 2, Chapter 2, section 1 is numbered “2.2.1”.

1.1.2 Scope

1.1.2.1 For the purposes of Article 2 paragraph 2 (a) and Article 4 of ADN, the annexed Regulations specify:

- (a) dangerous goods which are barred from international carriage;
- (b) dangerous goods which are authorized for international carriage and the conditions attaching to them (including exemptions) particularly with regard to:
 - classification of goods, including classification criteria and relevant test methods;
 - use of packagings (including mixed packing);
 - use of tanks (including filling);
 - consignment procedures (including marking and labelling of packages and placarding and marking of vehicles and wagons embarked, the marking of vessels as well as documentation and information required);
 - provisions concerning the construction, testing and approval of packagings and tanks;
 - use of means of transport (including loading, mixed loading and unloading).

1.1.2.2 For the purposes of Article 5 of ADN, section 1.1.3 of this chapter specifies the cases in which the carriage of dangerous goods is partially or totally exempted from the conditions of carriage established by ADN.

1.1.2.3 For the purposes of Article 7 of ADN, Chapter 1.5 of this part specifies the rules concerning the derogations, special authorizations and equivalences for which that article provides.

1.1.2.4 For the purposes of Article 8 of ADN, Chapter 1.6 of this part specifies the transitional measures concerning the application of the Regulations annexed to ADN.

1.1.2.5 The provisions of ADN also apply to empty vessels or vessels which have been unloaded as long as the holds, cargo tanks or receptacles or tanks accepted on board are not free from dangerous substances or gases, except for the exemptions for which section 1.1.3 of these Regulations provides.

1.1.3 Exemptions

1.1.3.1 *Exemptions related to the nature of the transport operation*

The provisions laid down in ADN do not apply to:

- (a) the carriage of dangerous goods by private individuals where the goods in question are packaged for retail sale and are intended for their personal or domestic use or for their leisure or sporting activities provided that measures have been taken to prevent any leakage of contents in normal conditions of carriage. When these goods are flammable liquids carried in refillable receptacles filled by, or for, a private individual, the total quantity shall not exceed 60 litres per receptacle and 240 litres per cargo transport unit. Dangerous goods in IBCs, large packagings or tanks are not considered to be packaged for retail sale;
- (b) the carriage of machinery or equipment not specified in these annexed Regulations and which happen to contain dangerous goods in their internal or operational equipment, provided that measures have been taken to prevent any leakage of contents in normal conditions of carriage;
- (c) the carriage undertaken by enterprises which is ancillary to their main activity, such as deliveries to or returns from building or civil engineering sites, or in relation to surveying, repairs and maintenance, in quantities of not more than 450 litres per packaging and within the maximum quantities specified in 1.1.3.6. Measures shall be taken to prevent any leakage of contents in normal conditions of carriage. These exemptions do not apply to Class 7.

Carriage undertaken by such enterprises for their supply or external or internal distribution does not fall within the scope of this exemption;

- (d) the carriage undertaken by, or under the supervision of, the emergency services, insofar as such carriage is necessary in relation to the emergency response, in particular carriage undertaken to contain and recover the dangerous goods involved in an incident or accident and move them to a safe place;
- (e) emergency transport under the supervision of the competent authorities intended to save human lives or protect the environment provided that all measures are taken to ensure that such transport is carried out in complete safety;
- (f) the carriage of uncleaned empty static storage vessels which have contained gases of Class 2, groups A, O or F, substances of Class 3 or Class 9 belonging to packing group II or III or pesticides of Class 6.1 belonging to packing group II or III, subject to the following conditions:

All openings with the exception of pressure relief devices (when fitted) are hermetically closed;

Measures have been taken to prevent any leakage of contents in normal conditions of carriage; and

The load is fixed in cradles or crates or other handling devices or to the vehicle, container or vessel in such a way that they will not become loose or shift during normal conditions of carriage.

This exemption does not apply to static storage vessels which have contained desensitized explosives or substances the carriage of which is prohibited by ADN.

NOTE: For radioactive material see 1.7.1.4.

1.1.3.2 Exemptions related to the carriage of gases

The provisions laid down in ADN do not apply to the carriage of:

- (a) *(Reserved)*;
- (b) *(Reserved)*;
- (c) gases of Groups A and O (according to 2.2.2.1), if the pressure of the gas in the receptacle or tank at a temperature of 20 °C does not exceed 200 kPa (2 bar) and if the gas is not a liquefied or a refrigerated liquefied gas. This includes every kind of receptacle or tank, e.g. also parts of machinery and apparatus;
- (d) gases contained in the equipment used for the operation of the vessel (e.g. fire extinguishers), including spare parts;
- (e) *(Reserved)*;
- (f) gases contained in foodstuffs or beverages.

1.1.3.3 Exemptions related to substances used for the propulsion of vessels, vehicles or wagons carried, for the operation of their special equipment, for their upkeep or for the safety.

The requirements of ADN do not apply to substances used for the propulsion of vessels, vehicles or wagons carried, for the operation of their special equipment, for their upkeep or to ensure safety, which are carried on board in the packaging, receptacle or tanks intended for use for this purpose.

1.1.3.4 Exemptions related to special provisions or to dangerous goods packed in limited or excepted quantities

NOTE: For radioactive material see 1.7.1.4.

1.1.3.4.1 Certain special provisions of Chapter 3.3 exempt partially or totally the carriage of specific dangerous goods from the requirements of ADN. The exemption applies when the special provision is referred to in Column (6) of Table A of Chapter 3.2 against the dangerous goods entry concerned.

1.1.3.4.2 Certain dangerous goods may be subject to exemptions provided that the conditions of Chapter 3.4 are met.

1.1.3.4.3 Certain dangerous goods may be subject to exemptions provided that the conditions of Chapter 3.5 are met.

1.1.3.5 Exemptions related to empty uncleaned packagings

Empty uncleaned packagings (including IBCs and large packagings) which have contained substances of Classes 2, 3, 4.1, 5.1, 6.1, 8 and 9 are not subject to the conditions of ADN if adequate measures have been taken to nullify any hazards. Hazards are nullified if adequate measures have been taken to nullify all hazards of Classes 1 to 9.

1.1.3.6 Exemptions related to quantities carried on board vessels

- 1.1.3.6.1 (a) In the event of the carriage of dangerous goods in packages, the provisions of ADN other than those of 1.1.3.6.2 are not applicable when the gross mass of all the dangerous goods carried does not exceed 3,000 kg.

This provision does not apply to the carriage of:

- (i) substances and articles of Class 1;
 - (ii) substances of Class 2, groups T, F, TF, TC, TO, TFC or TOC, according to 2.2.2.1.3 and aerosols of groups C, CO, F, FC, T, TF, TC, TO, TFC and TOC according to 2.2.2.1.6;
 - (iii) substances of Classes 4.1 or 5.2. for which a danger label of model No. 1 is required in column (5) of Table A of Chapter 3.2;
 - (iv) substances of Class 6.2, Group A;
 - (v) substances of Class 7 other than UN Nos. 2908, 2909, 2910 and 2911;
 - (vi) substances assigned to Packing Group I;
 - (vii) substances carried in tanks;
- (b) In the event of the carriage of dangerous goods in packages other than tanks, the provisions of ADN other than those of 1.1.3.6.2 are not applicable to the carriage of:
- substances of Class 2 of group F in accordance with 2.2.2.1.3 or aerosols of group F according to 2.2.2.1.6; or
 - substances assigned to Packing Group I, except substances of Class 6.1 when the gross mass of these goods does not exceed 300 kg.

- 1.1.3.6.2 The carriage of exempted quantities according to 1.1.3.6.1 is, however, subject to the following conditions:

- (a) The obligation to report in accordance with 1.8.5 remains applicable;
- (b) Packages, except vehicles and containers (including swap bodies), shall comply with the requirements for packagings referred to in Parts 4 and 6 of ADR or RID; the provisions of Chapter 5.2 concerning marking and labelling are applicable;
- (c) The following documents shall be on board:
 - the transport documents (see 5.4.1.1); they shall concern all the dangerous goods carried on board;
 - the stowage plan (see 7.1.4.11.1);
- (d) The goods shall be stowed in the holds.

This provision does not apply to goods loaded in:

 - containers with complete spray-proof walls;
 - vehicles with complete spray-proof walls;
- (e) Goods of different class shall be separated by a minimum horizontal distance of 3 m. They shall not be stowed on top of each other.

This provision does not apply to:

- containers with complete metal walls;
- vehicles with complete metal walls;

- (f) For seagoing and inland navigation vessels, where the latter carry only containers, the above requirements under (d) and (e) shall be considered to have been met if the provisions of the IMDG Code regarding stowage and separation are met and if this particular is recorded in the transport document.

1.1.3.7 Exemptions related to the carriage of lithium batteries

The provisions laid down in ADN do not apply to:

- (a) Lithium batteries installed in a means of transport, performing a transport operation and destined for its propulsion or for the operation of any of its equipment;
- (b) Lithium batteries contained in an equipment for the operation of this equipment used or intended for the use during transport carriage (e.g. a laptop computer).

1.1.4 Applicability of other regulations

1.1.4.1 General

The following requirements are applicable to packages:

- (a) In the case of packagings (including large packagings and intermediate bulk containers (IBCs)), the applicable requirements of one of the international regulations shall be met (see also Part 4 and Part 6);
- (b) In the case of containers, tank-containers, portable tanks and multiple element gas containers (MEGCs), the applicable requirements of ADR, RID or the IMDG Code shall be met (see also Part 4 and Part 6);
- (c) In the case of vehicles or wagons, the vehicles or wagons and their load shall meet the applicable requirements of ADR or of RID, as relevant.

NOTE: For the marking, labelling, placarding and orange plate marking, see also Chapters 5.2 and 5.3.

1.1.4.2 Carriage in a transport chain including maritime, road, rail or air carriage

1.1.4.2.1

Packages, containers, portable tanks and tank-containers, which do not entirely meet the requirements for packing, mixed packing, marking, labelling of packages or placarding and orange plate marking, of ADN, but are in conformity with the requirements of the IMDG Code or the ICAO Technical Instructions shall be accepted for carriage in a transport chain including maritime or air carriage subject to the following conditions:

- (a) If the packages are not marked and labelled in accordance with ADR, they shall bear markings and danger labels in accordance with the requirements of the IMDG Code or the ICAO Technical Instructions;
- (b) The requirements of the IMDG Code or the ICAO Technical Instructions shall be applicable to mixed packing within a package;

- (c) For carriage in a transport chain including maritime carriage, if the containers, portable tanks or tank-containers are not marked and placarded in accordance with Chapter 5.3 of these Regulations, they shall be marked and placarded in accordance with Chapter 5.3 of the IMDG Code. In such case, only 5.3.2.1.1 of these Regulations is applicable to the marking of the vehicle itself. For empty, uncleaned portable tanks and tank-containers, this requirement shall apply up to and including the subsequent transfer to a cleaning station.

This derogation does not apply in the case of goods classified as dangerous goods in classes 1 to 9 of ADN and considered as non-dangerous goods according to the applicable requirements of the IMDG Code or the ICAO Technical Instructions.

- 1.1.4.2.2 When a maritime, road, rail or air transport operation follows or precedes carriage by inland waterway, the transport document used or to be used for the maritime, road, rail or air transport operation may be used in place of the transport document prescribed in 5.4.1 provided that the particulars it contains are in conformity with the applicable requirements of the IMDG Code, ADR, RID or the ICAO Technical Instructions, respectively except that, when additional information is required by ADN, it shall be added or entered at the appropriate place.

NOTE: For carriage in accordance with 1.1.4.2.1, see also 5.4.1.1.7. For carriage in containers, see also 5.4.2.

1.1.4.3 *(Reserved)*

1.1.4.4 *(Reserved)*

1.1.4.5 *(Reserved)*

1.1.4.6 *Other regulations applicable to carriage by inland waterway*

1.1.4.6.1 In accordance with article 9 of ADN, transport operations shall remain subject to the local, regional or international requirements generally applicable to the carriage of goods by inland waterway.

1.1.4.6.2 Where the requirements of these Regulations are in contradiction with the requirements referred to in 1.1.4.6.1, the requirements referred to in 1.1.4.6.1 shall not apply.

CHAPTER 1.2

DEFINITIONS AND UNITS OF MEASUREMENT

1.2.1 Definitions

NOTE: This section contains all general or specific definitions.

For the purposes of these regulations:

A

Accommodation means spaces intended for the use of persons normally living on board, including galleys, food stores, lavatories, washrooms, bathrooms, laundries, halls, alleyways, etc., but excluding the wheelhouse;

ADR means the European Agreement concerning the International Carriage of Dangerous Goods by Road;

Aerosol, see *Aerosol dispenser*;

Aerosol dispenser means any non-refillable receptacle meeting the requirements of 6.2.6 of ADR or of RID made of metal, glass or plastics, and containing a gas, compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder, and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state;

Animal material means animal carcasses, animal body parts, or animal foodstuffs;

Approval

Multilateral approval, for the carriage of Class 7 material, means approval by the relevant competent authority of the country of origin of the design or shipment, as applicable, and by the competent authority of each country through or into which the consignment is to be carried. The term “through or into” specifically excludes “over”, i.e. the approval and notification requirements shall not apply to a country over which radioactive material is carried in an aircraft, provided that there is no scheduled stop in that country;

Unilateral approval, for the carriage of Class 7 material, means an approval of a design which is required to be given by the competent authority of the country of origin of the design only. If the country of origin is not a Contracting Party to ADN, the approval shall require validation by the competent authority of the first Contracting Party to ADN reached by the consignment (see 6.4.22.6 of ADR);

ASTM means the American Society for Testing and Materials (ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428-2959, United States of America);

Auto-ignition temperature (EN 1127-1:1997, No. 331) means the lowest temperature determined under prescribed test conditions of a hot surface on which a flammable substance in the form of a gas/air or vapour/air mixture ignites.

B

Bag means a flexible packaging made of paper, plastics film, textiles, woven material or other suitable material;

Battery-vehicle means a vehicle containing elements which are linked to each other by a manifold and permanently fixed to a transport unit. The following elements are considered to be elements of a battery-vehicle: cylinders, tubes, bundles of cylinders (also known as frames), pressure drums as well as tanks destined for the carriage of gases of Class 2 with a capacity of more than 450 litres;

Battery-wagon means a wagon containing elements which are linked to each other by a manifold and permanently fixed to a wagon. The following elements are considered to be elements of a battery wagon: cylinders, tubes, bundles of cylinders (also known as frames), pressure drums as well as tanks intended for gases of Class 2 with a capacity greater than 450 litres;

BC Code means the Code of Safe Practice for Solid Bulk Cargoes of the International Maritime Organization (IMO);

Bilge water means oily water from the engine room bilges, the peak, the cofferdams and the double-hull spaces;

Biological/technical name means a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose;

Body (for all categories of IBC other than composite IBCs) means the receptacle proper, including openings and closures, but does not include service equipment;

Box means a packaging with complete rectangular or polygonal faces, made of metal, wood, plywood, reconstituted wood, fibreboard, plastics or other suitable material. Small holes for purposes of ease of handling or opening or to meet classification requirements, are permitted as long as they do not compromise the integrity of the packaging during carriage;

Breathing apparatus (ambient air-dependent filter apparatus) means an apparatus which protects the person wearing it when working in a dangerous atmosphere by means of a suitable filter. For such apparatuses, see for example European standard EN 136:1998. For the filters used, see for example European standard EN 371:1992 or EN 372:1992;

Breathing apparatus (self-contained) means an apparatus which supplies the person wearing it when working in a dangerous atmosphere with breathing air by means of pressurized air carried with him or by means of an external supply via a tube. For such apparatuses, see for example European standard EN 137:1993 or EN 138:1994;

Bulk containers means containment systems (including any liner or coating) intended for the carriage of solid substances which are in direct contact with the containment system. Packagings, intermediate bulk containers (IBCs), large packagings and tanks are not included.

Bulk containers are:

- of a permanent character and accordingly strong enough to be suitable for repeated use;
- specially designed to facilitate the carriage of goods by one or more modes of carriage without intermediate reloading;
- fitted with devices permitting its ready handling;
- of a capacity of not less than 1.0 m³.

Examples of bulk containers are containers, offshore bulk containers, skips, bulk bins, swap bodies, trough-shaped containers, roller containers, load compartments of vehicles or wagons;

Bulkhead means a metal wall, generally vertical, inside the vessel and which is bounded by the bottom, the side plating, a deck, the hatchway covers or by another bulkhead;

Bulkhead (watertight) means

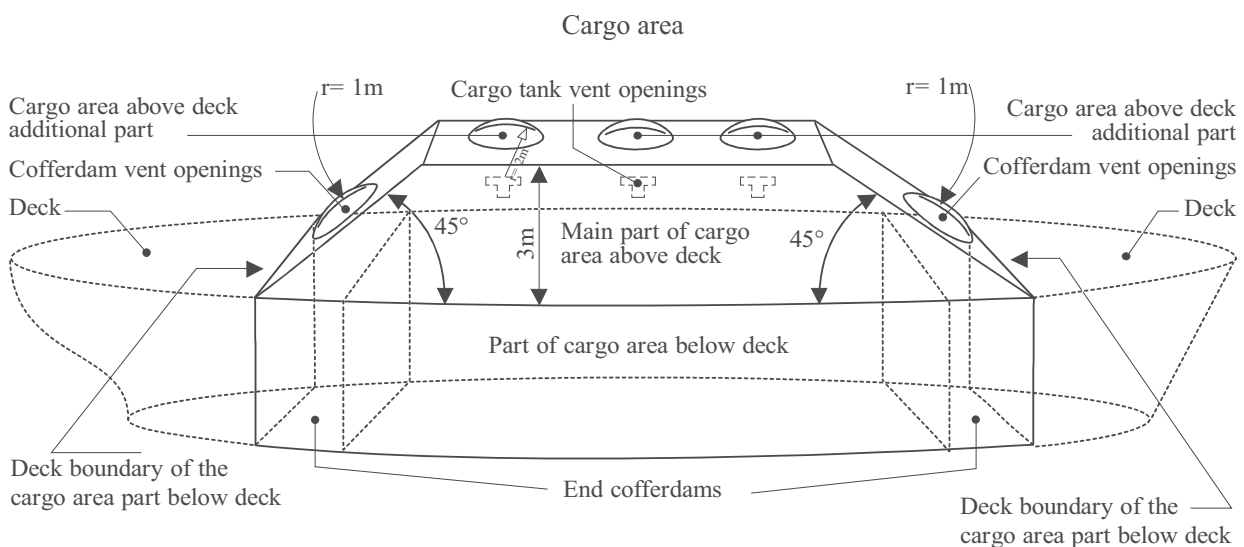
- In a dry cargo vessel: a bulkhead constructed so that it can withstand water pressure with a head of 1.00 metre above the deck but at least to the top of the hatchway coaming;
- In a tank vessel: a bulkhead constructed to withstand a water pressure of 1.00 metre above the deck;

Bundle of cylinders (frame) means an assembly of cylinders that are fastened together and are interconnected by a manifold and carried as a unit. The total water capacity shall not exceed 3,000 litres except that bundles intended for the carriage of toxic gases of Class 2 (groups starting with letter T according to 2.2.2.1.3) shall be limited to 1,000 litres water capacity.

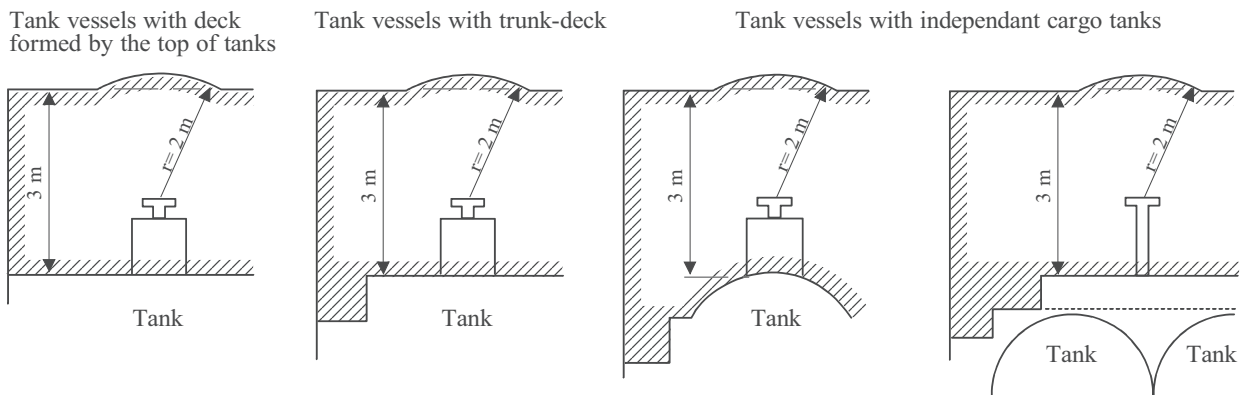
C

Capacity of shell or shell compartment, for tanks, means the total inner volume of the shell or shell compartment expressed in litres or cubic metres. When it is impossible to completely fill the shell or the shell compartment because of its shape or construction, this reduced capacity shall be used for the determination of the degree of filling and for the marking of the tank;

Cargo area means the whole of the following spaces (see figures below);



Above deck cargo area for various tank vessel



Cargo area (additional part above deck) (When anti-explosion protection is required, comparable to zone 1) means the spaces not included in the main part of cargo area above deck comprising 1.00 m radius spherical segments centred over the ventilation openings of the cofferdams and the service spaces located in the cargo area part below the deck and 2.00 m spherical segments centred over the ventilation openings of the cargo tanks and the opening of the pump-rooms;

Cargo area (main part above deck) (When anti-explosion protection is required - comparable to zone 1) means the space which is bounded:

- at the sides, by the shell plating extending upwards from the decks sides;
- fore and aft, by planes inclined at 45° towards the cargo area, starting at the boundary of the cargo area part below deck;
- vertically, 3 m above the deck;

Cargo area (part below deck) means the space between two vertical planes perpendicular to the centre-line plane of the vessel, which comprises cargo tanks, hold spaces, cofferdams, double-hull spaces and double bottoms; these planes normally coincide with the outer cofferdam bulkheads or hold end bulkheads. Their intersection line with the deck is referred to as the boundary of the cargo area part below deck;

Cargo piping, see *Pipes for loading and unloading*;

Cargo pump-room (When anti-explosion protection is required, comparable to zone 1) means a service space where the cargo pumps and stripping pumps are installed together with their operational equipment;

Cargo residues, see *Slops*;

Cargo tank (When anti-explosion protection is required, comparable to zone 0) means a tank which is permanently attached to the vessel and the boundaries of which are either formed by the hull itself or by walls separate from the hull and which is intended for the carriage of dangerous goods;

Cargo tank (condition)

- discharged : empty, but containing residual cargo;
- empty : dry, but not gas-free;
- gas-free : not containing any measurable concentration of dangerous gases;

Cargo transport unit means a vehicle, a wagon, a container, a tank-container, a portable tank or an MEGC;

Carriage means the change of place of dangerous goods, including stops made necessary by transport conditions and including any period spent by the dangerous goods in vessels, vehicles, wagons, tanks and containers made necessary by traffic conditions before, during and after the change of place.

This definition also covers the intermediate temporary storage of dangerous goods in order to change the mode or means of transport (transshipment). This shall apply provided that transport documents showing the place of dispatch and the place of reception are presented on request and provided that packages and tanks are not opened during intermediate storage, except to be checked by the competent authorities;

Carriage in bulk means the carriage of an unpackaged solid which can be discharged;

NOTE: *Within the meaning of ADN, the carriage in bulk referred to in ADR or RID is considered as carriage in packages.*

Carrier means the enterprise which carries out the transport operation with or without a transport contract;

Certified safe type electrical apparatus means an electrical apparatus which has been tested and approved by the competent authority regarding its safety of operation in an explosive atmosphere, e.g.

- intrinsically safe apparatus;
- flameproof enclosure apparatus;
- apparatus protected by pressurization;
- powder filling apparatus;
- apparatus protected by encapsulation;
- increased safety apparatus.

NOTE: *Limited explosion risk apparatus is not covered by this definition.*

CEVNI means the UNECE European Code for Inland Waterways;

CGA means the Compressed Gas Association (CGA, 4221 Walney Road, 5th Floor, Chantilly VA 20151-2923, United States of America);

Classification society (recognized) means a classification society which is recognized by the competent authorities in accordance with Chapter 1.15;

Classification of zones (see Directive 1999/92/CE)*

Zone 0: areas in which dangerous explosive atmospheres of gases, vapours or sprays exist permanently or during long periods;

* Official Journal of the European Communities No. L 23 of 28 January 2000, p.57.

Zone 1: areas in which dangerous explosive atmospheres of gases, vapours or sprays are likely to occur occasionally;

Zone 2: areas in which dangerous explosive atmospheres of gases, vapours or sprays are likely to occur rarely and if so for short periods only;

Closed container, see *Container*;

Closed-type sampling device means a device penetrating through the boundary of the cargo tank but constituting a part of a closed system designed so that during sampling no gas or liquid may escape from the cargo tank. The device shall be of a type approved by the competent authority for this purpose;

Closed vehicle means a vehicle having a body capable of being closed;

Closed wagon means a wagon with sides and a fixed or movable roof.

Closure means a device which closes an opening in a receptacle;

Cofferdam (when anti-explosion protection is required, comparable to zone 1) means an athwartship compartment which is bounded by watertight bulkheads and which can be inspected. The cofferdam shall extend over the whole area of the end bulkheads of the cargo tanks. The bulkhead not facing the cargo area shall extend from one side of the vessel to the other and from the bottom to the deck in one frame plane;

Collective entry means an entry for a well-defined group of substances or articles (see 2.1.1.2, B, C and D);

Combination packaging means a combination of packagings for transport purposes, consisting of one or more inner packagings secured in an outer packing in accordance with 4.1.1.5 of ADR;

NOTE: The “*inners*” of “*Combination packagings*” are always termed “*inner packagings*” and not “*inner receptacles*”. A glass bottle is an example of such an “*inner packaging*”.

Common vapour piping means a pipe connecting two or more cargo tanks. This pipe is fitted with safety valves which protect cargo tanks against unacceptable internal overpressures or vacuums; it is intended to evacuate gases and vapours to the shore facility;

Compensation piping means a pipe of the shore facility which is connected during the unloading to the vessel’s common vapour pipe or gas return piping. This pipe is designed so as to protect the vessel against detonations or the passage of flames from the shore side;

Competent authority means the authority or authorities or any other body or bodies designated as such in each State and in each specific case in accordance with domestic law;

Compliance assurance (radioactive material) means a systematic programme of measures applied by a competent authority which is aimed at ensuring that the requirements of ADN are met in practice;

Composite IBC with plastics inner receptacle means an IBC comprising structural equipment in the form of a rigid outer casing encasing a plastics inner receptacle together with any service or other structural equipment. It is so constructed that the inner receptacle and outer casing once assembled form, and are used as, an integrated single unit to be filled, stored, transported or emptied as such;

NOTE: Plastics material, when used in connection with inner receptacles for composite IBCs, is taken to include other polymeric materials such as rubber.

Composite packaging (plastics material) is a packaging consisting of an inner plastics receptacle and an outer packaging (made of metal, fibreboard, plywood, etc.). Once assembled such a packaging remains thereafter an inseparable unit; it is filled, stored, despatched and emptied as such;

NOTE: See NOTE under Composite packagings (glass, porcelain or stoneware).

Composite packaging (glass, porcelain or stoneware) is a packaging consisting of an inner glass, porcelain or stoneware receptacle and an outer packaging (made of metal, wood, fibreboard, plastics material, expanded plastics material, etc.). Once assembled, such a packaging remains thereafter an inseparable unit; it is filled, stored, despatched and emptied as such;

NOTE: The “inners” of “composite packagings” are normally termed “inner receptacles”. For example, the “inner” of a 6HA1 (composite packaging, plastics material) is such an “inner receptacle” since it is normally not designed to perform a containment function without its “outer packaging” and is not therefore an “inner packaging”.

Confinement system, for the carriage of Class 7 material, means the assembly of fissile material and packaging components specified by the designer and agreed to by the competent authority as intended to preserve criticality safety;

Consignee means the consignee according to the contract for carriage. If the consignee designates a third party in accordance with the provisions applicable to the contract for carriage, this person shall be deemed to be the consignee within the meaning of ADN. If the transport operation takes place without a contract for carriage, the enterprise which takes charge of the dangerous goods on arrival shall be deemed to be the consignee;

Consignment means any package or packages, or load of dangerous goods, presented by a consignor for carriage;

Consignor means the enterprise which consigns dangerous goods either on its own behalf or for a third party. If the transport operation is carried out under a contract for carriage, consignor means the consignor according to the contract for carriage. In the case of a tank vessel, when the cargo tanks are empty or have just been unloaded, the master is considered to be the consignor for the purpose of the transport document;

Containment system, for the carriage of Class 7 material, means the assembly of components of the packaging specified by the designer as intended to retain the radioactive material during carriage;

Container means an article of transport equipment (lift van or other similar structure):

- of a permanent character and accordingly strong enough to be suitable for repeated use;
- specially designed to facilitate the carriage of goods, by one or more means of transport, without breakage of load;
- fitted with devices permitting its ready stowage and handling, particularly when being transloaded from one means of transport to another;
- so designed as to be easy to fill and empty ;

- having an internal volume of not less than 1 m³, except for containers for the carriage of radioactive material.

In addition:

Closed container means a totally enclosed container having a rigid roof, rigid side walls, rigid end walls and a floor. The term includes containers with an opening roof where the roof can be closed during transport;

Large container means:

- (a) a container which does not meet the definition of a small container;
- (b) in the meaning of the CSC, a container of a size such that the area enclosed by the four outer bottom corners is either
 - (i) at least 14 m² (150 square feet) or
 - (ii) at least 7 m² (75 square feet) if fitted with top corner fittings;

Open container means an open top container or a platform based container;

Sheeted container means an open container equipped with a sheet to protect the goods loaded;

Small container means a container which has either any overall outer dimension (length, width or height) less than 1.5 m, or an internal volume of not more than 3 m³;

A swap body is a container which, in accordance with European Standard EN 283 (1991 edition) has the following characteristics:

- from the point of view of mechanical strength, it is only built for carriage on a wagon or a vehicle on land or by roll-on roll-off ship;
- it cannot be stacked;
- it can be removed from vehicles by means of equipment on board the vehicle and on its own supports, and can be reloaded;

NOTE: The term “container” does not cover conventional packagings, IBCs, tank-containers, vehicles or wagons. Nevertheless, a container may be used as a packaging for the carriage of radioactive material.

Control temperature means the maximum temperature at which an organic peroxide or a self-reactive substance can be safely carried;

Conveyance means, with respect to the carriage by inland waterway, any vessel, hold or defined deck area of any vessel; for carriage by road or by rail, it means a vehicle or a wagon;

Crate means an outer packaging with incomplete surfaces;

Criticality safety index (CSI) assigned to a package, overpack or container containing fissile material, for the carriage of Class 7 material, means a number which is used to provide

control over the accumulation of packages, overpacks or containers containing fissile material;

Critical temperature means the temperature above which the substance cannot exist in the liquid state;

Cryogenic receptacle means a transportable thermally insulated receptacle for refrigerated liquefied gases of a water capacity of not more than 1,000 litres;

CSC means the International Convention for Safe Containers (Geneva, 1972) as amended and published by the International Maritime Organization (IMO), London;

Cylinder means a transportable pressure receptacle of a water capacity not exceeding 150 litres (see also *Bundle of cylinders (frame)*);

D

Damage control plan means the plan indicating the boundaries of the watertight compartments serving as the basis for the stability calculations, in the event of a leak, the trimming arrangements for the correction of any list due to flooding and the means of closure which are to be kept closed when the vessel is under way;

Dangerous goods means those substances and articles the carriage of which is prohibited by ADN, or authorized only under the conditions prescribed therein;

Dangerous reaction means:

- (a) combustion or evolution of considerable heat;
- (b) evolution of flammable, asphyxiate, oxidizing or toxic gases;
- (c) the formation of corrosive substances;
- (d) the formation of unstable substances; or
- (e) dangerous rise in pressure (for tanks and cargo tanks only);

Deflagration means an explosion which propagates at subsonic speed (see EN 1127-1:1997);

Demountable tank means a tank, other than a fixed tank, a portable tank, a tank-container or an element of a battery-vehicle or a MEGC which has a capacity of more than 450 litres, is not designed for the carriage of goods without breakage of load, and normally can only be handled when it is empty;

Design, for the carriage of Class 7 material, means the description of special form radioactive material, low dispersible radioactive material, package or packaging which enables such an item to be fully identified. The description may include specifications, engineering drawings, reports demonstrating compliance with regulatory requirements, and other relevant documentation;

Design pressure means the pressure on the basis of which the cargo tank or the residual cargo tank has been designed and built;

Detonation means an explosion which propagates at supersonic speed and is characterized by a shock-wave (see EN 1127-1:1997);

Drum means a flat-ended or convex-ended cylindrical packaging made out of metal, fibreboard, plastics, plywood or other suitable materials. This definition also includes packagings of other shapes, e.g. round, taper-necked packagings or pail-shaped packagings. *Wooden barrels* and *jerricans* are not covered by this definition.

E

EC Directive means provisions decided by the competent institutions of the European Community and which are binding, as to the result to be achieved, upon each Member State to which it is addressed, but shall leave to the national authorities the choice of form and methods;

Emergency temperature means the temperature at which emergency procedures shall be implemented in the event of loss of temperature control;

Electrical apparatus protected against water jets means an electrical apparatus so designed that water, projected by a nozzle on the enclosure from any direction, has no damaging effects. The test conditions are specified in the IEC publication 529, minimum degree of protection IP55;

EN (standard) means a European standard published by the European Committee for Standardization (CEN) (CEN – 36 rue de Stassart B-1050 Brussels);

Enterprise means any natural person, any legal person, whether profit-making or not, any association or group of persons without legal personality, whether profit-making or not, or any official body, whether it has legal personality itself or is dependent upon an authority that has such personality;

Escape device (suitable) means a respiratory protection device, designed to cover the wearer's mouth, nose and eyes, which can be easily put on and which serves to escape from a danger area. For such devices, see for example European standard EN 400:1993, EN 401:1993, EN 402:1993, EN 403:1993 or EN 1146:1997;

Exclusive use, for the carriage of Class 7 material, means the sole use, by a single consignor, of a conveyance or of a large container, in respect of which all initial, intermediate and final loading and unloading is carried out in accordance with the directions of the consignor or consignee;

Explosion means a sudden reaction of oxidation or decomposition with an increase in temperature or in pressure or both simultaneously (see EN 1127-1:1997);

Explosion danger areas means areas in which an explosive atmosphere may occur of such a scale that special protection measures are necessary to ensure the safety and health of the persons affected (see Directive 1999/92/EC*);

Explosion group means a grouping of flammable gases and vapours according to their maximum experimental safe gaps and minimum ignition currents, and of electrical apparatus which may be used in the corresponding potentially explosive atmosphere (see IEC publication 79 and EN 50014: 1994).

Explosive atmosphere means a mixture of air with gases, vapours or mists flammable in atmospheric conditions, in which the combustion process spreads after ignition to the entire unconsumed mixture (see EN 1127-1:1997);

* Official Journal of the European Communities No. L 23 of 28 January 2000, p.57.

F

Fibreboard IBC means a fibreboard body with or without separate top and bottom caps, if necessary an inner liner (but no inner packagings), and appropriate service and structural equipment;

Filler means any enterprise

- (a) which fills dangerous goods into a tank (tank-vehicle, tank wagon, demountable tank, portable tank or tank-container) or into a battery-vehicle, battery-wagon or MEGC; or
- (b) which fills dangerous goods into a cargo tank; or
- (c) which fills dangerous goods into a vessel, a vehicle, a wagon, a large container or small container for carriage in bulk;

Filling pressure means the maximum pressure actually built up in the tank when it is being filled under pressure; (see also *Calculation pressure*, *Discharge pressure*, *Maximum working pressure (gauge pressure)* and *Test pressure*);

Filling ratio means the ratio of the mass of gas to the mass of water at 15° C that would fill completely a pressure receptacle fitted ready for use (capacity);

Filling ratio (cargo tank): Where a filling ratio is given for a cargo tank, it refers to the percentage of the volume of the cargo tank which may be filled with liquid during loading;;

Fixed tank means a tank having a capacity of more than 1,000 litres which is permanently attached to a vehicle (which then becomes a tank-vehicle) or to a wagon (which then becomes a tank-wagon) or is an integral part of the frame of such vehicle or wagon;

Flame arrester means a device mounted in the vent of part of an installation or in the interconnecting piping of a system of installations, the purpose of which is to permit flow but prevent the propagation of a flame front. This device shall be tested according to the European standard EN 12 874 (1999);

Flame arrester plate stack means the part of the flame arrester the main purpose of which is to prevent the passage of a flame front;

Flame arrester housing means the part of a flame arrester the main purpose of which is to form a suitable casing for the flame arrester plate stack and ensure a mechanical connection with other systems;

Flammable component (for aerosols) means flammable liquids, flammable solids or flammable gases and gas mixtures as defined in Notes 1 to 3 of sub-section 31.1.3 of Part III of the Manual of Tests and Criteria. This designation does not cover pyrophoric, self-heating or water-reactive substances. The chemical heat of combustion shall be determined by one of the following methods ASTM D 240, ISO/FDIS 13943: 1999 (E/F) 86.1 to 86.3 or NFPA 30B;

Flammable gas detector means a device allowing measuring of any significant concentration of flammable gases given off by the cargo below the lower explosive limit and which clearly indicates the presence of higher concentrations of such gases. Flammable gas detectors may be designed for measuring flammable gases only but also for measuring both flammable gases and oxygen.

This device shall be so designed that measurements are possible without the necessity of entering the spaces to be checked;

Flash-point means the lowest temperature of a liquid at which its vapours form a flammable mixture with air;

Flexible IBC means a body constituted of film, woven fabric or any other flexible material or combinations thereof, and if necessary, an inner coating or liner, together with any appropriate service equipment and handling devices;

Frame (Class 2), see *Bundle of cylinders*;

Full load means any load originating from one consignor for which the use of a vehicle, of a wagon or of a large container is exclusively reserved and all operations for the loading and unloading of which are carried out in conformity with the instructions of the consignor or of the consignee;

NOTE: The corresponding term for Class 7 is "exclusive use".

G

Gas (for the purposes of Class 2) means a substance which:

- (a) at 50° C has a vapour pressure greater than 300 kPa (3 bar); or
- (b) is completely gaseous at 20° C under standard pressure of 101.3 kPa;

Otherwise, *Gases* means gases or vapours;

Gas cartridge means any non-refillable receptacle containing, under pressure, a gas or a mixture of gases. It may be fitted with a valve;

Gas detection system means a fixed system capable of detecting in time significant concentrations of flammable gases given off by the cargoes at concentrations below the lower explosion limit and capable of activating the alarms;

Gas return piping means a pipe connecting a cargo tank to the shore facility during loading. This pipe is fitted with safety valves protecting the cargo tank against unacceptable internal overpressures or vacuums; it is intended to evacuate gases to the shore facility;

GHS means the second revised edition of the Globally Harmonized System of Classification and Labelling of Chemicals, published by the United Nations as document ST/SG/AC.10/30/Rev.2;

H

Handling device (for flexible IBCs) means any sling, loop, eye or frame attached to the body of the IBC or formed from the continuation of the IBC body material;

Hermetically closed tank means a tank intended for the carriage of liquid substances with a calculation pressure of at least 4 bar or intended for the carriage of solid substances (powdery or granular) regardless of its calculation pressure, the openings of which are hermetically closed and which:

- is not equipped with safety valves, bursting discs, other similar safety devices or vacuum valves, or

- is not equipped with safety valves, bursting discs or other similar safety devices, but is equipped with vacuum valves, in accordance with the requirements of 6.8.2.2.3; of ADR; or
- is equipped with safety valves preceded by a bursting disc according to 6.8.2.2.10 of ADR, but is not equipped with vacuum valves; or
- is equipped with safety valves preceded by a bursting disc according to 6.8.2.2.10 of ADR and vacuum valves, in accordance with the requirements of 6.8.2.2.3 of ADR;

Highest class may be assigned to a vessel when:

- the hull, inclusive of rudder and steering gear and equipment of anchors and chains, complies with the rules and regulations of a recognized classification society and has been built and tested under its supervision;
- the propulsion plant, together with the essential auxiliary engines mechanical and electrical installations, have been made and tested in conformity with the rules and regulations of this classification society, and the installation has been carried out under its supervision, and the complete plant was tested to its satisfaction on completion;

High velocity vent valve means a pressure-reducing valve with a nominal ejection speed greater than the speed of propagation of a flame, thus preventing the passage of a flame front. This type of installation shall be tested in accordance with European standard EN 12 874 (1999);

Hold (when anti-explosion protection is required, comparable to zone 1 - see *Classification of zones*) means a part of the vessel which, whether covered by hatchway covers or not, is bounded fore and aft by bulkheads and which is intended to carry goods in packages or in bulk. The upper boundary of the hold is the upper edge of the hatchway coaming. Cargo extending above the hatchway coaming shall be considered as loaded on deck;

Hold (condition)

discharged: empty, but containing residual cargo
empty: without residual cargo (swept clean);

Hold space (when anti-explosion protection is required, comparable to zone 1) means an enclosed part of the vessel which is bounded fore and aft by watertight bulkheads and which is intended only to carry cargo tanks independent of the vessel's hull.

I

IAEA means the International Atomic Energy Agency (IAEA), (IAEA, P.O. Box 100 – A-1400 Vienna);

IBC see *Intermediate bulk container*;

IBC Code means the International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk, published by the International Maritime Organization (IMO);

ICAO means the International Civil Aviation Organization (ICAO, 999 University Street, Montreal, Quebec H3C 5H7, Canada);

ICAO Technical Instructions means the Technical Instructions for the Safe Transport of Dangerous Goods by Air, which complement Annex 18 to the Chicago Convention on International Civil Aviation (Chicago 1944) published by the International Civil Aviation Organization (ICAO) in Montreal;

Identification number means the number for identifying a substance to which no UN number has been assigned or which cannot be classified under a collective entry with a UN number.

These numbers have four figures beginning with 9;

IEC means The International Electro technical Commission;

IMDG Code means the International Maritime Dangerous Goods Code, for the implementation of Chapter VII, Part A, of the International Convention for the Safety of Life at Sea, 1974 (SOLAS Convention), published by the International Maritime Organization (IMO), London;

IMO means the International Maritime Organization (IMO, 4 Albert Embankment, London SE1 7SR, United Kingdom);

Independent cargo tank (when anti-explosion protection is required, comparable to zone 0) means a cargo tank which is permanently built in, but which is independent of the vessel's structure;

Inner packaging means a packaging for which an outer packaging is required for carriage;

Inner receptacle means a receptacle which requires an outer packaging in order to perform its containment function;

Inspection body means an independent monitoring and verification body certified by the competent authority;

Instruction means transmitting know-how or teaching how to do something or how to act. This transmission or teaching may be dispensed internally by the personnel;

Intermediate bulk container (IBC) means a rigid, or flexible portable packaging, other than those specified in Chapter 6.1 of ADR, that:

- (a) has a capacity of:
 - (i) not more than 3 m³ for solids and liquids of packing groups II and III;
 - (ii) not more than 1.5 m³ for solids of packing group I when packed in flexible, rigid plastics, composite, fibreboard and wooden IBCs;
 - (iii) not more than 3 m³ for solids of packing group I when packed in metal IBCs;
 - (iv) not more than 3 m³ for radioactive material of Class 7;
- (b) is designed for mechanical handling;
- (c) is resistant to the stresses produced in handling and transport as determined by the tests specified in Chapter 6.5 of ADR;

(see also *Composite IBC with plastics inner receptacle, Fibreboard IBC, Flexible IBC, Metal IBC, Rigid plastics IBC and Wooden IBC*)

NOTE 1: Portable tanks or tank-containers that meet the requirements of Chapter 6.7 or 6.8 of ADR respectively are not considered to be intermediate bulk containers (IBCs).

NOTE 2: Intermediate bulk containers (IBCs) which meet the requirements of Chapter 6.5 of ADR are not considered to be containers for the purposes of ADN.

Intermediate packaging means a packaging placed between inner packagings or articles and an outer packaging;

International regulations means ADR, BC Code, ICAO-TI, IMDG Code or RID.

ISO (standard) means an international standard published by the International Organization for Standardization (ISO) (ISO, 1, rue de Varembe, CH-1204, Geneva 20);

J

Jerrican means a metal or plastics packaging of rectangular or polygonal cross-section with one or more orifices.

L

Large container, see *Container*;

Large packaging means a packaging consisting of an outer packaging which contains articles or inner packagings and which:

- (a) is designed for mechanical handling;
- (b) exceeds 400 kg net mass or 450 litres capacity but has a volume of not more than 3 m³;

Light-gauge metal packaging means a packaging of circular, elliptical, rectangular or polygonal cross-section (also conical) and taper-necked and pail-shaped packaging made of metal, having a wall thickness of less than 0.5 mm (e.g. tinplate), flat or convex bottomed and with one or more orifices, which is not covered by the definitions for drums or jerricans;

Limited explosion risk electrical apparatus means an electrical apparatus which, during normal operation, does not cause sparks or exhibits surface temperatures which are above the required temperature class, including e.g.:

- three-phase squirrel cage rotor motors;
- brushless generators with contactless excitation;
- fuses with an enclosed fuse element;
- contactless electronic apparatus;

or means an electrical apparatus with an enclosure protected against water jets (degree of protection IP55) which during normal operation does not exhibit surface temperatures which are above the required temperature class;

Liner means a tube or bag inserted into a packaging, including large packagings or IBCs, but not forming an integral part of it, including the closures of its openings;

Liquid means a substance which at 50° C has a vapour pressure of not more than 300 kPa (3 bar) which is not completely gaseous at 20° C and 101.3 kPa, and which:

- (a) has a melting point or initial melting point of 20° C or less at a pressure of 101.3 kPa, or
- (b) is liquid according to the ASTM D 4359-90 test method or
- (c) is not pasty according to the criteria applicable to the test for determining fluidity (penetrometer test) described in 2.3.4;

NOTE: “Carriage in the liquid state” for the purpose of tank requirements means:

- Carriage of liquids according to the above definition, or
- Solids handed over for carriage in the molten state;

Loader means any enterprise which loads dangerous goods into a vessel, vehicle, wagon or large container;

Loading journal means a journal where all activities relating to loading, unloading, cleaning, gas-freeing, delivering washing water and taking in and discharging ballast water (in cargo tanks) are recorded.

M

Manual of Tests and Criteria means the fourth revised edition of the United Nations Model Regulations on the Transport of Dangerous Goods, Manual of Tests and Criteria, published by the United Nations Organization (ST/SG/AC.10/11/Rev.4 as amended by documents ST/SG/AC.10/11/Rev.4/Amend.1 and ST/SG/AC.10/11/Rev.4/Amend.2);

Mass density shall be expressed in kg/m³. In the event of repetition, the number alone shall be used;

Mass of package means gross mass of the package unless otherwise stated. The mass of containers, tanks, vehicles and wagons used for the carriage of goods is not included in the gross mass;

Master means a person as defined in Article 1.02 of the European Code for Inland Waterways (CEVNI);

Maximum capacity means the maximum inner volume of receptacles or packagings including intermediate bulk containers (IBCs) and large packagings expressed in cubic metres or litres;

Maximum net mass means the maximum net mass of contents in a single packaging or maximum combined mass of inner packagings and the contents thereof expressed in kilograms;

Maximum normal operating pressure, for the carriage of Class 7 material, means the maximum pressure above atmospheric pressure at mean sea-level that would develop in the containment system in a period of one year under the conditions of temperature and solar radiation corresponding to environmental conditions in the absence of venting, external cooling by an ancillary system, or operational controls during carriage;

Maximum permissible gross mass, means

- (a) (for all categories of IBCs other than flexible IBCs) means the mass of the IBC and any service or structural equipment together with the maximum net mass;
- (b) (for tanks) means the tare of the tank and the heaviest load authorized for carriage;

NOTE: For portable tanks, see Chapter 6.7 of ADR.

Maximum permissible load (for flexible IBCs) means the maximum net mass for which the IBC is intended and which it is authorized to carry;

Maximum working pressure means the maximum pressure occurring in a cargo tank or a residual cargo tank during operation. This pressure equals the opening pressure of high velocity vent valves;

MEGC, see *Multiple-element gas container*;

Metal IBC means a metal body together with appropriate service and structural equipment;

Multiple-element gas container (MEGC) means a unit containing elements which are linked to each other by a manifold and mounted on a frame. The following elements are considered to be elements of a multiple-element gas container: cylinders, tubes, pressure drums and bundles of cylinders as well as tanks for the carriage of gases of Class 2 having a capacity of more than 450 litres.

NOTE: For UN MEGCs, see Chapter 6.7 of ADR.

N

Naked light means a source of light using a flame which is not enclosed in a flameproof enclosure.

Nominal capacity of the receptacle means the nominal volume of the dangerous substance contained in the receptacle expressed in litres. For compressed gas cylinders the nominal capacity shall be the water capacity of the cylinder;

N.O.S. entry (*not otherwise specified entry*) means a collective entry to which substances, mixtures, solutions or articles may be assigned if they:

- (a) are not mentioned by name in Table A of Chapter 3.2, and
- (b) exhibit chemical, physical and/or dangerous properties corresponding to the Class, classification code, packing group and the name and description of the n.o.s. entry;

Not readily flammable means a material which is not in itself readily flammable or whose outer surface at least is not readily flammable and limits the propagation of a fire to an appropriate degree.

In order to determine flammability, the IMO procedure, Resolution A.653(16), or any equivalent requirements of a Contracting State are recognized;

O

Offshore bulk container means a bulk container specially designed for repeated use for carriage to, from and between offshore facilities. An offshore bulk container is designed and constructed in accordance with the guidelines for the approval of offshore containers

handled in open seas specified by the International Maritime Organization (IMO) in document MSC/Circ.860;

Oil separator vessel means an open type N tank-vessel with a dead weight of up to 300 tonnes, constructed and fitted to accept and carry oily and greasy wastes from the operation of vessels. Vessels without cargo tanks are considered to be subject to Chapters 9.1 or 9.2;

Oily and greasy wastes from the operation of the vessel means used oils, bilge water and other oily or greasy wastes, such as used grease, used filters, used rags, and receptacles and packagings for such wastes;

Open container, see *Container*;

Open vehicle means a vehicle the platform of which has no superstructure or is merely provided with side boards and a tailboard;

Open wagon means a wagon with or without side boards and a tailboard, the loading surfaces of which are open.

Opening pressure means the pressure referred to in a list of substances in Chapter 3.2, Table C at which the high velocity vent valves open. For pressure tanks the opening pressure of the safety valve shall be established in accordance with the requirements of the competent authority or a recognized classification society;

OTIF means Intergovernmental Organisation for International Carriage by Rail (OTIF, Gryphenhübeliweg 30, CH-3006 Bern);

Outer packaging means the outer protection of the composite or combination packaging together with any absorbent materials, cushioning and any other components necessary to contain and protect inner receptacles or inner packagings;

Overpack means an enclosure used (by a single consignor in the case of Class 7) to contain one or more packages, consolidated into a single unit easier to handle and stow during carriage;

Examples of overpacks:

- (a) a loading tray such as a pallet, on which several packages are placed or stacked and secured by a plastics strip, shrink or stretch wrapping or other appropriate means; or
- (b) an outer protective packaging such as a box or a crate;

Oxygen meter means a device allowing measuring of any significant reduction of the oxygen content of the air. Oxygen meters may either be a device for measuring oxygen only or part of a combination device for measuring both flammable gas and oxygen.

This device shall be so designed that measurements are possible without the necessity of entering the spaces to be checked.

P

Package means the complete product of the packing operation, consisting of the packaging or large packaging or IBC and its contents prepared for dispatch. Except for the carriage of radioactive material, the term includes receptacles for gases as defined in this section as well as articles which, because of their size, mass or configuration may be carried unpackaged or carried in cradles, crates or handling devices.

The term does not apply to goods which are carried in bulk in the holds of vessels, nor to substances carried in tanks in tank vessels.

On board vessels, the term also includes vehicles, wagons, containers (including swap bodies), tank-containers, portable tanks, battery-vehicles, battery-wagons, tank vehicles, tank wagons and multiple element gas containers (MECGs).

NOTE: For radioactive material, see 2.2.7.2., 4.1.9.1.1 and Chapter 6.4 of ADR.

Packaging means one or more receptacles and any other components or materials necessary for the receptacles to perform their containment and other safety functions (see also *Combination packaging*, *Composite packaging (plastics material)*, *Composite packaging (glass, porcelain or stoneware)*, *Inner packaging*, *Intermediate bulk container (IBC)*, *Intermediate packaging*, *Large packaging*, *Light-gauge metal packaging*, *Outer packaging*, *Reconditioned packaging*, *Remanufactured packaging*, *Reused packaging*, *Salvage packaging* and *Sift-proof packaging*);

Packer means any enterprise which puts dangerous goods into packagings, including large packagings and intermediate bulk containers (IBCs) and, where necessary, prepares packages for carriage;

Packing group means a group to which, for packing purposes, certain substances may be assigned in accordance with their degree of danger. The packing groups have the following meanings which are explained more fully in Part 2:

Packing group I : Substances presenting high danger;
Packing group II : Substances presenting medium danger; and
Packing group III : Substances presenting low danger;

NOTE: Certain articles containing dangerous goods are assigned to a packing group.

Partly closed sampling device means a device penetrating through the boundary of the cargo tank such that during sampling only a small quantity of gaseous or liquid cargo can escape into the open air. As long as the device is not used it shall be closed completely. The device shall be of a type approved by the competent authority for this purpose;

Pipes for loading or unloading (cargo piping) means all pipes which may contain liquid or gaseous cargo, including the connected pumps, filters and closure devices;

Portable tank means a multimodal tank having, when used for the carriage of Class 2 substances, a capacity of more than 450 litres in accordance with the definitions in Chapter 6.7 of ADR or the IMDG Code and indicated by a portable tank instruction (T-Code) in Column (10) of Table A of Chapter 3.2 of ADR;

Portable tank operator, see *Tank-container/portable tank operator*;

Possibility of cargo heating means a cargo heating installation in the cargo tanks using a heat insulator. The heat insulator may be heated by means of a boiler on board the tank vessel (cargo heating system in accordance with 9.3.2.42 or 9.3.3.42) or from shore;

Possibility of a sampling connection means a locking connection for a closed-type or partly closed sampling device. The connection shall be fitted with a locking mechanism resistant to the internal pressure of the cargo tank. The installation shall be of a type certified by the competent authority for the intended use;

Pressure drum means a welded, transportable pressure receptacle of a water capacity exceeding 150 litres and of not more than 1,000 litres (e.g. cylindrical receptacles equipped with rolling hoops, spheres on skids);

Pressure relief device means a spring-loaded device which is activated automatically by pressure the purpose of which is to protect the cargo tank against unacceptable excess internal pressure;

Pressure receptacle means a collective term that includes cylinders, tubes, pressure drums, closed cryogenic receptacles and bundles of cylinders;

Pressures For tanks, all kinds of pressures (e.g. working pressure, opening pressure of the high velocity vent valves, test pressure) shall be expressed as gauge pressures in kPa (bar); the vapour pressure of substances, however, shall be expressed as an absolute pressure in kPa (bar);

Pressure tank means a tank designated and approved for a working pressure ≥ 400 kPa (4 bar).

Pressurized gas cartridge, see *Aerosol dispenser*;

Protected area means

- (a) the hold or holds (when anti-explosion protection is required, comparable to zone 1);
- (b) the space situated above the deck (when anti-explosion protection is required, comparable to zone 2), bounded:
 - (i) athwartships, by vertical planes corresponding to the side plating;
 - (ii) fore and aft, by vertical planes corresponding to the end bulkheads of the hold; and
 - (iii) upwards, by a horizontal plane 2.00 m above the upper level of the load, but at least by a horizontal plane 3.00 m above the deck.

Protected IBC (for metal IBCs) means an IBC provided with additional protection against impact, the protection taking the form of, for example, a multi-layer (sandwich) or double-wall construction, or a frame with a metal lattice-work casing.

Protective gloves means gloves which protect the wearer's hands during work in a danger area. The choice of appropriate gloves shall correspond to the dangers likely to arise. For protective gloves, see for example European standard EN 374-1:1994, 374-2:1994 or 374-3:1994;

Protective goggles, protective masks means goggles or face protection which protects the wearer's eyes or face during work in a danger area. The choice of appropriate goggles or masks shall correspond to the dangers likely to arise. For protective goggles or masks, see for example European standard EN 166:2001;

Protective shoes (or protective boots) means shoes or boots which protect the wearer's feet during work in a danger area. The choice of appropriate protective shoes or boots shall correspond to the dangers likely to arise. For protective shoes or boots, see for example European standard EN 346:1997;

Protective suit means a suit which protects the wearer's body during work in a danger area. The choice of appropriate suit shall correspond to the dangers likely to arise. For protective suits, see for example European standard EN 340:1993;

Q

Quality assurance means a systematic programme of controls and inspections applied by any organization or body which is aimed at providing confidence that the safety prescriptions in ADN are met in practice.

R

Radiation level, for the carriage of Class 7 material, means the corresponding dose rate expressed in millisieverts per hour;

Radioactive contents, for the carriage of Class 7 material, mean the radioactive material together with any contaminated or activated solids, liquids, and gases within the packaging;

Receptacle (Class 1) includes boxes, cylinders, cans, drums, jars and tubes, including any means of closure used in the inner or intermediate packaging;

Receptacle means a containment vessel for receiving and holding substances or articles, including any means of closing. This definition does not apply to shells (see also *Cryogenic receptacle*, *Inner receptacle*, *Rigid inner receptacle* and *Gas cartridge*);

Recycled plastics material means material recovered from used industrial packagings that has been cleaned and prepared for processing into new packagings;

Reel (Class 1) means a device made of plastics, wood, fibreboard, metal or other suitable material comprising a central spindle with, or without, side walls at each end of the spindle. Articles and substances can be wound on to the spindle and may be retained by side walls;

Rescue winch means a device for hoisting persons from spaces such as cargo tanks, cofferdams and double-hull spaces. The device shall be operable by one person;

Residual cargo means liquid cargo remaining in the cargo tank or cargo piping after unloading without the use of the stripping system;

RID means Regulations concerning the International Carriage of Dangerous Goods by Rail, Appendix C of COTIF (Convention concerning International Carriage by Rail);

Rigid inner receptacle (for composite IBCs) means a receptacle which retains its general shape when empty without its closures in place and without benefit of the outer casing. Any inner receptacle that is not rigid is considered to be flexible;

Rigid plastics IBC means a rigid plastics body, which may have structural equipment together with appropriate service equipment;

S

Safety adviser means a person who, in an undertaking the activities of which include the carriage, or the related packing, loading, filling or unloading, of dangerous goods by inland waterways, is responsible for helping to prevent the risks inherent in the carriage of dangerous goods;

Safety valve means a spring-loaded device which is activated automatically by pressure the purpose of which is to protect the cargo tank against unacceptable excess internal pressure or negative internal pressure (see also, *High velocity vent valve*, *Pressure-relief device* and *Vacuum valve*);

SADT see *Self-accelerating decomposition temperature*;

Salvage packaging means a special packaging into which damaged, defective or leaking dangerous goods packages, or dangerous goods that have spilled or leaked are placed for purposes of carriage for recovery or disposal;

Sampling opening means an opening with a diameter of not more than 0.30 m fitted with a flame arrester plate stack, capable of withstanding steady burning and so designed that the opening period will be as short as possible and that the flame arrester plate stack cannot remain open without external intervention. The flame arrester plate stack shall be of a type approved by the competent authority for this purpose;

Self-accelerating decomposition temperature (SADT), means the lowest temperature at which self-accelerating decomposition may occur with substance in the packaging as used during carriage. Provisions for determining the SADT and the effects of heating under confinement are contained in Part II of the Manual of Tests and Criteria;

Service space means a space which is accessible during the operation of the vessel and which is neither part of the accommodation nor of the cargo tanks, with the exception of the forepeak and after peak, provided no machinery has been installed in these latter spaces;

Settled pressure means the pressure of the contents of a pressure receptacle in thermal and diffusive equilibrium;

Sheeted container, see *Container*;

Sheeted vehicle means an open vehicle provided with a sheet to protect the load;

Sheeted wagon means an open wagon provided with a sheet to protect the load;

Sift-proof packaging means a packaging impermeable to dry contents, including fine solid material produced during carriage;

Slops means liquid cargo residues which cannot be removed from the cargo tank or cargo piping by discharging, draining or stripping; by extension, a mixture of cargo residues and washing water, rust, etc., which is either suitable or not suitable for pumping;

Small container, see *Container*;

Small receptacle containing gas, see *Gas cartridge*;

SOLAS means the International Convention for the Safety of Life at Sea, 1974, as amended;

Solid means:

- (a) a substance with a melting point or initial melting point of more than 20 °C at a pressure of 101.3 kPa; or
- (b) a substance which is not liquid according to the ASTM D 4359-90 test method or which is pasty according to the criteria applicable to the test for determining fluidity (penetrometer test) described in 2.3.4;

STCW means the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended.

Steady burning means combustion stabilized for an indeterminate period (see EN 12 874:1999);

Stripping system (efficient) means a system for draining the cargo tanks and stripping the cargo piping except for the cargo remains and residues;

Supply installation (bunkering system) means an installation for the supply of vessels with liquid fuels;

Supply vessel means an open type N tank vessel with a dead weight of up to 300 tonnes, constructed and fitted for the carriage and delivery to other vessels of products intended for the operation of vessels;

Swap-body, see *Container*.

T

Tank means a shell, including its service and structural equipment. When used alone, the term tank means a tank-container, portable tank, demountable tank, fixed tank or tank wagon as defined in this part, including tanks forming elements of battery-vehicles, battery wagons or MEGCs (see also *Demountable tank*, *Fixed tank*, *Portable tank* and *Multiple-element gas container*);

NOTE: For portable tanks, see 6.7.4.1 of ADR.

Tank-container means an article of transport equipment meeting the definition of a container, and comprising a shell and items of equipment, including the equipment to facilitate movement of the tank-container without significant change of attitude, used for the carriage of gases, liquid, powdery or granular substances and, when used for the carriage of Class 2 substances having a capacity of more than 0.45 m³ (450 litres);

NOTE: IBCs which meet the requirements of Chapter 6.5 of ADR are not considered to be tank-containers.

Tank-container/portable tank operator means any enterprise in whose name the tank-container/portable tank is registered;

Tank record means a file containing all the important technical information concerning a tank, a battery-vehicle, a battery wagon or an MEGC, such as certificates referred to in 6.8.2.3, 6.8.2.4 and 6.8.3.4 of ADR;

Tank swap body is considered to be a tank-container;

Tank-vehicle means a vehicle built to carry liquids, gases or powdery or granular substances and comprising one or more fixed tanks. In addition to the vehicle proper, or the units of running gear used in its stead, a tank-vehicle comprises one or more shells, their items of equipment and the fittings for attaching them to the vehicle or to the running-gear units;

Tank vessel means a vessel intended for the carriage of substances in cargo tanks;

Tank wagon means a wagon intended for the carriage of liquids, gases, powdery or granular substances, comprising a superstructure, consisting of one or more tanks and their equipment and an underframe fitted with its own items of equipment (running gear, suspension, buffing, traction, braking gear and inscriptions).

NOTE: Tank wagon also includes wagons with demountable tanks.

Technical name means a recognized chemical name, or a recognized biological name where relevant, or another name currently used in scientific and technical handbooks, journals and texts (see 3.1.2.8.1.1);

Temperature class means a grouping of flammable gases and vapours of flammable liquids according to their ignition temperature; and of the electrical apparatus intended to be used in the corresponding potentially explosive atmosphere according to their maximum surface temperature (see IEC publication 79 and EN 50 014:1994);

Test pressure means the pressure at which a cargo tank, a residual cargo tank, a cofferdam or the loading and unloading pipes shall be tested prior to being brought into service for the first time and subsequently regularly within prescribed times;

Toximeter means a device allowing measuring of any significant concentration of toxic gases given off by the cargo.

This device shall be so designed that such measurements are possible without the necessity of entering the spaced to be checked.

Training means teaching instruction, courses or apprenticeships dispensed by an organizer approved by the competent authority;

Transport index (TI) assigned to a package, overpack or container, or to unpackaged LSA-I or SCO-I, for the carriage of Class 7 material, means a number which is used to provide control over radiation exposure;

Transport unit means a motor vehicle without an attached trailer, or a combination consisting of a motor vehicle and an attached trailer;

Tray (Class 1) means a sheet of metal, plastics, fibreboard or other suitable material which is placed in the inner, intermediate or outer packaging and achieves a close-fit in such packaging. The surface of the tray may be shaped so that packagings or articles can be inserted, held secure and separated from each other;

Tube means a seamless transportable pressure receptacle of a water capacity exceeding 150 litres and of not more than 3,000 litres;

Types of protection (see IEC Publication 79 and EN 50 014:1994)

EEx (d)	:	flameproof enclosure (EN 50 018);
EEx (e)	:	increased safety (EN 50 019);
EEx (ia) and EEx (ib)	:	intrinsic safety (EN 50 020);
EEx (m)	:	encapsulation (EN 50 028);
EEx (p)	:	pressurized apparatus (EN 50 016);
EEx (q)	:	powder filling (EN 50 017).

Type of vessel

Type G : means a tank vessel intended for the carriage of gases. Carriage may be under pressure or under refrigeration.

Type C : means a tank vessel intended for the carriage of liquids. The vessel shall be of the flush-deck/double-hull type with double-hull spaces, double bottoms, but without trunk. The cargo tanks may be formed by the

vessel's inner hull or may be installed in the hold spaces as independent tanks.

Type N: means a tank vessel intended for the carriage of liquids.

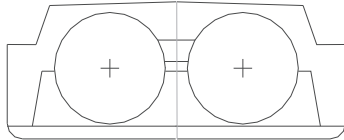
Closed Type N : a tank vessel intended for the carriage of liquids in closed cargo tanks.

Open type N : a tank vessel intended for the carriage of liquids in open cargo tanks.

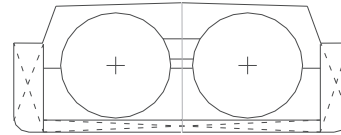
Open Type N with flame arrester :a tank vessel intended for the carriage of liquids in open cargo tanks whose openings to the atmosphere are equipped with a flame arrester capable of withstanding steady burning.

Sketches (as example)

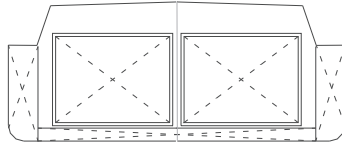
Type G :



Type G Condition of cargo tank 1,
Type of cargo tanks 1
(also by flush-deck)

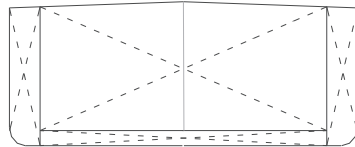


Type G Condition of cargo tank 1,
Type of cargo tanks 1
(also by flush-deck)

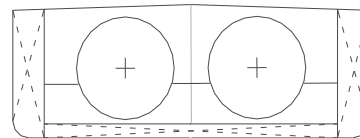


Type G Condition of cargo tank 2,
Type of cargo tank 1
(also by flush-deck)

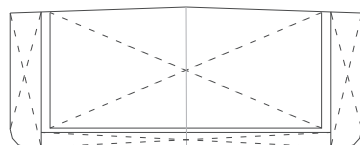
Type C :



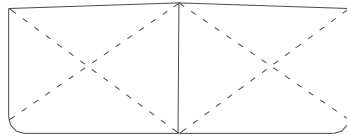
Type C Condition of cargo tank 2,
Type of cargo tank 2



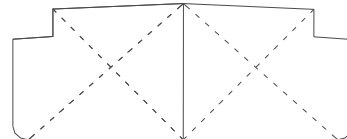
Type C Condition of cargo tank 1,
Type of cargo tank 1



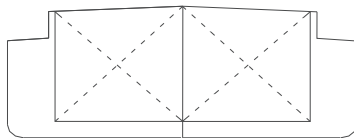
Type C Condition of cargo tank 2
Type of cargo tank 1

Type N :

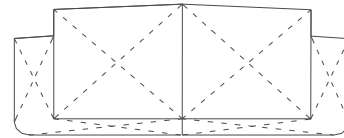
Type N Condition of cargo tank 2, 3 or 4
Type of cargo tank 2



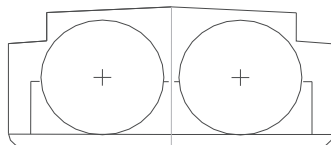
Type N Condition of cargo tank 2, 3 or 4
Type of cargo tank 2



Type N Condition of cargo tank 2, 3 or 4
Type of cargo tanks 1
(also by flush-deck)



Type N Condition of cargo tank 2, 3 or 4
Type of cargo tank 3
(also by flush-deck)



Type N Condition of cargo tank 2, 3 or 4
Type of cargo tank 1
(also by flush-deck)

U

UIC means the International Union of Railways (UIC, 16 rue Jean Rey, F-75015 Paris, France);

Undertaking, see *Enterprise*;

UNECE means the United Nations Economic Commission for Europe (UNECE, Palais des Nations, 8-14 avenue de la Paix, CH-1211 Geneva 10, Switzerland);

UN Model Regulations means the Model Regulations annexed to the fifteenth revised edition of the Recommendations on the Transport of Dangerous Goods published by the United Nations (ST/SG/AC.10/1/Rev.15);

UN number means the four-figure identification number of the substance or article taken from the United Nations Model Regulations.

V

Vacuum design pressure means the vacuum pressure on the basis of which the cargo tank or the residual cargo tank has been designed and built;

Vacuum-operated waste tank means a fixed or demountable tank primarily used for the carriage of dangerous wastes, with special constructional features and/or equipment to facilitate the loading and unloading of wastes as specified in Chapter 6.10 of ADR. A tank which fully complies with the requirements of Chapter 6.7 or 6.8 of ADR is not considered to be a vacuum-operated waste tank;

Vacuum valve means a spring-loaded device which is activated automatically by pressure the purpose of which is to protect the cargo tank against unacceptable negative internal pressure;

Vehicle means any vehicle covered by the definition of the term vehicle in the ADR (see *Battery-vehicle*, *Closed vehicle*, *Open vehicle*, *Sheeted vehicle* and *Tank-vehicle*);

Venting piping means a pipe of the shore facility which is connected during the loading to the vessel's common vapour pipe or gas return piping. This pipe is designed so as to protect the vessel against detonations or the passage of flames from the shoreside;

Vessel means an inland navigation vessel or a seagoing vessel.

W

Wagon means a rail vehicle without its own means of propulsion that runs on its own wheels on railway tracks and is used for the carriage of goods;

Wastes means substances, solutions, mixtures or articles for which no direct use is envisaged but which are transported for reprocessing, dumping, elimination by incineration or other methods of disposal;

Wooden barrel means a packaging made of natural wood, of round cross-section, having convex walls, consisting of staves and heads and fitted with hoops;

Wooden IBC means a rigid or collapsible wooden body, together with an inner liner (but no inner packaging) and appropriate service and structural equipment;

Working pressure means the settled pressure of a compressed gas at a reference temperature of 15° C in a full pressure receptacle.

NOTE: For tanks, see *Maximum working pressure*.

1.2.2 Units of measurement

1.2.2.1 The following units of measurement^a are applicable in ADN:

Measurement of	SI Unit ^b	Acceptable alternative unit	Relationship between units
Length	m (metre)	-	-
Area	m ² (square metre)	-	-
Volume	m ³ (cubic metre)	l ^c (litre)	1 l = 10 ⁻³ m ³
Time	s (second)	min. (minute) h (hour) d (day)	1 min. = 60 s 1 h = 3 600 s 1 d = 86 400 s
Mass	kg (kilogram)	g (gramme) t (ton)	1 g = 10 ⁻³ kg 1 t = 10 ³ kg
Mass density	kg/m ³	kg/l	1 kg/l = 10 ³ kg/m ³
Temperature	K (kelvin)	°C (degree Celsius)	0° C = 273.15 K
Temperature difference	K (kelvin)	°C (degree Celsius)	1° C = 1 K
Force	N (newton)	-	1 N = 1 kg.m/s ²
Pressure	Pa (pascal)	bar (bar)	1 Pa = 1 N/m ² 1 bar = 10 ⁵ Pa
Stress	N/m ²	N/mm ²	1 N/mm ² = 1 MPa
Work	J (joule)	kWh (kilowatt hours)	1 kWh = 3.6 MJ
Energy	J (joule)	-	1 J = 1 N.m = 1 W.s
Quantity of heat	-	eV (electronvolt)	1 eV = 0.1602 H 10 ⁻¹⁸ J
Power	W (watt)	-	1 W = 1 J/s = 1 N.m/s
Kinematic viscosity	m ² /s	mm ² /s	1 mm ² /s = 10 ⁻⁶ m ² /s
Dynamic viscosity	Pa.s	mPa.s	1 mPa.s = 10 ⁻³ Pa.s
Activity	Bq (becquerel)	-	-
Dose equivalent	Sv (sievert)	-	-

^a The following round figures are applicable for the conversion of the units hitherto used into SI Units.

<u>Force</u>		<u>Stress</u>	
1 kg	= 9.807 N	1 kg/mm ²	= 9.807 N/mm ²
1 N	= 0.102 kg	1 N/mm ²	= 0.102 kg/mm ²

<u>Pressure</u>				
1 Pa	= 1 N/m ²	= 10 ⁻⁵ bar	= 1.02 H 10 ⁻⁵ kg/cm ²	= 0.75 H 10 ⁻² torr
1 bar	= 10 ⁵ Pa	= 1.02 kg/cm ²	= 750 torr	=
1 kg/cm ²	= 9.807 H 10 ⁴ Pa	= 0.9807 bar	= 736 torr	=
1 torr	= 1.33 H 10 ² Pa	= 1.33 H 10 ⁻³ bar	= 1.36 H 10 ⁻³ kg/cm ²	=

Energy, Work, Quantity of heat

1 J	= 1 N.m	= 0.278 H 10 ⁻⁶ kWh	= 0.102 kgm	= 0.239 H 10 ⁻³ kcal
1 kWh	= 3.6 H 10 ⁶ J	= 367 H 10 ³ kgm	= 860 kcal	
1 kgm	= 9.807 J	= 2.72 H 10 ⁻⁶ kWh	= 2.34 H 10 ⁻³ kcal	
1 kcal	= 4.19 H 10 ³ J	= 1.16 H 10 ⁻³ kWh	= 427 kgm	

Power

1 W	= 0.102 kgm/s	= 0.86 kcal/h
1 kgm/s	= 9.807 W	= 8.43 kcal/h
1 kcal/h	= 1.16 W	= 0.119 kgm/s

Kinematic viscosity

1 m ² /s	= 10 ⁴ St (Stokes)
1 St	= 10 ⁻⁴ m ² /s

Dynamic viscosity

$$\begin{array}{lclcl}
 1 \text{ Pa}\cdot\text{s} & = & 1 \text{ N}\cdot\text{s}/\text{m}^2 & = & 10 \text{ P (poise)} & = & 0.102 \text{ kg}\cdot\text{s}/\text{m}^2 \\
 1 \text{ P} & = & 0.1 \text{ Pa}\cdot\text{s} & = & 0.1 \text{ N}\cdot\text{s}/\text{m}^2 & = & 1.02 \text{ H}10^{-2} \text{ kg}\cdot\text{s}/\text{m}^2 \\
 1 \text{ kg}\cdot\text{s}/\text{m}^2 & = & 9.807 \text{ Pa}\cdot\text{s} & = & 9.807 \text{ N}\cdot\text{s}/\text{m}^2 & = & 98.07 \text{ P}
 \end{array}$$

^b The International System of Units (SI) is the result of decisions taken at the General Conference on Weights and Measures (Address: Pavillon de Breteuil, Parc de St-Cloud, F-92 310 Sèvres).

^c The abbreviation "L" for litre may also be used in place of the abbreviation "l" when a typewriter cannot distinguish between figure "1" and letter "l".

The decimal multiples and sub-multiples of a unit may be formed by prefixes or symbols, having the following meanings, placed before the name or symbol of the unit:

<u>Factor</u>			<u>Prefix</u>	<u>Symbol</u>
1 000 000 000 000 000 000	= 10 ¹⁸	quintillion	exa	E
1 000 000 000 000 000	= 10 ¹⁵	quadrillion	peta	P
1 000 000 000 000	= 10 ¹²	trillion	tera	T
1 000 000 000	= 10 ⁹	billion	giga	G
1 000 000	= 10 ⁶	million	mega	M
1 000	= 10 ³	thousand	kilo	k
100	= 10 ²	hundred	hecto	h
10	= 10 ¹	ten	deca	da
0.1	= 10 ⁻¹	tenth	deci	d
0.01	= 10 ⁻²	hundredth	centi	c
0.001	= 10 ⁻³	thousandth	milli	m
0.000 001	= 10 ⁻⁶	millionth	micro	μ
0.000 000 001	= 10 ⁻⁹	billionth	nano	n
0.000 000 000 001	= 10 ⁻¹²	trillionth	pico	p
0.000 000 000 000 001	= 10 ⁻¹⁵	quadrillionth	femto	f
0.000 000 000 000 000 001	= 10 ⁻¹⁸	quintillionth	atto	a

NOTE: 10⁹ = 1 billion is United Nations usage in English. By analogy, so is 10⁻⁹ = 1 billionth.

1.2.2.2 Unless expressly stated otherwise, the sign "%" in ADN represents:

- In the case of mixtures of solids or of liquids, and also in the case of solutions and of solids wetted by a liquid, a percentage mass based on the total mass of the mixture, the solution or the wetted solid;
- In the case of mixtures of compressed gases, when filled by pressure, the proportion of the volume indicated as a percentage of the total volume of the gaseous mixture, or, when filled by mass, the proportion of the mass indicated as a percentage of the total mass of the mixture;
- In the case of mixtures of liquefied gases and dissolved gases, the proportion of the mass indicated as a percentage of the total mass of the mixture.

1.2.2.3 Pressures of all kinds relating to receptacles (such as test pressure, internal pressure, safety valve opening pressure) are always indicated in gauge pressure (pressure in excess of atmospheric pressure); however, the vapour pressure of substances is always expressed in absolute pressure.

- 1.2.2.4 Where ADN specifies a degree of filling for receptacles, this is always related to a reference temperature of the substances of 15° C, unless some other temperature is indicated.

CHAPTER 1.3**TRAINING OF PERSONS INVOLVED IN THE CARRIAGE OF DANGEROUS GOODS****1.3.1 Scope and applicability**

Persons employed by the participants referred to in Chapter 1.4, whose duties concern the carriage of dangerous goods, shall receive training in the requirements governing the carriage of such goods appropriate to their responsibilities and duties. Training requirements specific to security of dangerous goods in Chapter 1.10 shall also be addressed.

NOTE 1: With regard to the training for the safety adviser, see 1.8.3.

NOTE 2: With regard to expert training, see Chapter 8.2.

NOTE 3: For training with regard to Class 7, see also 1.7.2.5.

NOTE 4: The training shall be effected before taking on responsibilities concerning the carriage of dangerous goods.

1.3.2 Nature of the training

The training shall take the following form, appropriate to the responsibility and duties of the individual concerned.

1.3.2.1 General awareness training

Personnel shall be familiar with the general requirements of the provisions for the carriage of dangerous goods.

1.3.2.2 Function-specific training

1.3.2.2.1 Personnel shall receive detailed training, commensurate directly with their duties and responsibilities in the requirements of the regulations concerning the carriage of dangerous goods. Where the carriage of dangerous goods involves a multimodal transport operation, the personnel shall be made aware of the requirements concerning other transport modes.

1.3.2.2.2 The crew shall be familiarized with the handling of fire-extinguishing systems and fire-extinguishers.

1.3.2.2.3 The crew shall be familiarized with the handling of the special equipment referred to in 8.1.5.

1.3.2.2.4 Persons wearing self-contained breathing apparatus shall be physically able to bear the additional constraints.

They shall:

- in the case of devices operating with pressurized air, be trained in their handling and maintenance;
- in the case of devices supplied with pressurized air through a hose, be instructed in their handling and maintenance. The instruction shall be supplemented by practical exercises.

1.3.2.2.5 The master shall bring the instructions in writing referred to in 5.4.3 to the attention of the other persons on board to ensure that they are capable of applying them.

1.3.2.3 *Safety training*

Commensurate with the degree of risk of injury or exposure arising from an incident involving the carriage of dangerous goods, including loading and unloading, personnel shall receive training covering the hazards and dangers presented by dangerous goods.

The training provided shall aim to make personnel aware of the safe handling and emergency response procedures.

1.3.3 **Documentation**

Details of all the training undertaken shall be kept by both the employer and the employee and shall be verified upon commencing a new employment. The training shall be periodically supplemented with refresher training to take account of changes in regulations.

CHAPTER 1.4

SAFETY OBLIGATIONS OF THE PARTICIPANTS

1.4.1 General safety measures

1.4.1.1 The participants in the carriage of dangerous goods shall take appropriate measures according to the nature and the extent of foreseeable dangers, so as to avoid damage or injury and, if necessary, to minimize their effects. They shall, in all events, comply with the requirements of ADN in their respective fields.

1.4.1.2 When there is an immediate risk that public safety may be jeopardized, the participants shall immediately notify the emergency services and shall make available to them the information they require to take action.

1.4.1.3 ADN may specify certain of the obligations falling to the various participants.

If a Contracting Party considers that no lessening of safety is involved, it may in its domestic legislation transfer the obligations falling to a specific participant to one or several other participants, provided that the obligations of 1.4.2 and 1.4.3 are met. These derogations shall be communicated by the Contracting Party to the secretariat of the United Nations Economic Commission for Europe which will bring them to the attention of the Contracting Parties.

The requirements of 1.2.1, 1.4.2 and 1.4.3 concerning the definitions of participants and their respective obligations shall not affect the provisions of domestic law concerning the legal consequences (criminal nature, liability, etc.) stemming from the fact that the participant in question is e.g. a legal entity, a self-employed worker, an employer or an employee.

1.4.2 Obligations of the main participants

NOTE: For radioactive material see also 1.7.6.

1.4.2.1 Consignor

1.4.2.1.1 The consignor of dangerous goods is required to hand over for carriage only consignments which conform to the requirements of ADN. In the context of 1.4.1, he shall in particular:

- (a) ascertain that the dangerous goods are classified and authorized for carriage in accordance with ADN;
- (b) furnish the carrier with information and data and, if necessary, the required transport documents and accompanying documents (authorizations, approvals, notifications, certificates, etc.), taking into account in particular the requirements of Chapter 5.4 and of the tables in Part 3;
- (c) use only packagings, large packagings, intermediate bulk containers (IBCs) and tanks (tank-vehicles, demountable tanks, battery-vehicles, MEGCs, portable tanks, tank-containers, tank wagons and battery wagons) approved for and suited to the carriage of the substances concerned and bearing the markings prescribed by one of the international Regulations, and to use only approved vessels or tank-vessels suitable for the carriage of the goods in question;
- (d) comply with the requirements on the means of dispatch and on forwarding restrictions;

- (e) ensure that even empty uncleaned and not degassed tanks (tank-vehicles, demountable tanks, battery-vehicles, MEGCs, portable tanks, tank-containers, tank wagons and tank vehicles) or empty uncleaned vehicles, wagons and large and small bulk containers are appropriately marked and labelled and that empty uncleaned tanks are closed and present the same degree of leakproofness as if they were full.

1.4.2.1.2 If the consignor uses the services of other participants (packer, loader, filler, etc.), he shall take appropriate measures to ensure that the consignment meets the requirements of ADN. He may, however, in the case of 1.4.2.1.1 (a), (b), (c) and (e), rely on the information and data made available to him by other participants.

1.4.2.1.3 When the consignor acts on behalf of a third party, the latter shall inform the consignor in writing that dangerous goods are involved and make available to him all the information and documents he needs to perform his obligations.

1.4.2.2 *Carrier*

1.4.2.2.1 In the context of 1.4.1, where appropriate, the carrier shall in particular:

- (a) ascertain that the dangerous goods to be carried are authorized for carriage in accordance with ADN;
- (b) ascertain that the prescribed documentation is on board the vessel;
- (c) ascertain visually that the vessels and loads have no obvious defects, leakages or cracks, missing equipment, etc.;
- (d) *(Reserved)*;
- (e) verify that the vessels are not overloaded;
- (f) *(Reserved)*;
- (g) provide the master with the required instructions in writing and ascertain that the prescribed equipment is on board the vessel;
- (h) ascertain that the marking requirements for the vessel have been met;
- (i) ascertain that during loading, carriage, unloading and any other handling of the dangerous goods in the holds or cargo tanks, special requirements are complied with.

Where appropriate, this shall be done on the basis of the transport documents and accompanying documents, by a visual inspection of the vessel or the containers and, where appropriate, the load.

1.4.2.2.2 The carrier may, however, in the case of 1.4.2.2.1 (a), (b) and (i), rely on information and data made available to him by other participants.

1.4.2.2.3 If the carrier observes an infringement of the requirements of ADN, in accordance with 1.4.2.2.1, he shall not forward the consignment until the matter has been rectified.

1.4.2.2.4 *(Reserved)*

1.4.2.2.5 *(Reserved)*

1.4.2.3 *Consignee*

1.4.2.3.1 The consignee has the obligation not to defer acceptance of the goods without compelling reasons and to verify, before, during or after unloading, that the requirements of ADN concerning him have been complied with.

In the context of 1.4.1, he shall in particular:

- (a) carry out in the cases provided for by ADN the prescribed operations for the unloading of vessels;
- (b) carry out in the cases provided for by ADN the prescribed cleaning and decontamination of the vessels;
- (c) ensure that the containers, vehicles and wagons, once completely unloaded, cleaned and decontaminated, no longer bear danger markings conforming to Chapter 5.3;
- (d) ascertain that provision has been made in the fore and aft sections of the vessel for its evacuation in the event of an emergency;
- (e) ascertain that in the cases provided for by ADN a flame-arrester is installed in the gas discharge pipe or the compensation pipe to protect the vessel against detonations and flame-fronts from the landward side;
- (f) ascertain that the seals he has put in place to ensure that the connections between the vessel's loading and discharging hoses are leakproof are made of a material which is not attacked by the cargo, which does not cause the decomposition of the cargo and does not cause a harmful or dangerous reaction with the cargo;
- (g) ascertain that permanent and appropriate surveillance is ensured for the entire duration of loading or discharging;
- (h) ascertain that, during discharging by means of the on-board pump, it is possible for the shore facility to switch it off.

1.4.2.3.2 If the consignee makes use of the services of other participants (unloader, cleaner, decontamination facility, etc.) he shall take appropriate measures to ensure that the requirements of ADN have been complied with.

1.4.2.3.3 If these verifications bring to light an infringement of the requirements of ADN, the consignee shall return a container or a vehicle or a wagon to the carrier only after the infringement has been remedied.

1.4.3 **Obligations of the other participants**

A non-exhaustive list of the other participants and their respective obligations is given below. The obligations of the other participants flow from section 1.4.1 above insofar as they know or should have known that their duties are performed as part of a transport operation subject to ADN;

1.4.3.1 *Loader*

1.4.3.1.1 In the context of 1.4.1, the loader has the following obligations in particular:

- (a) He shall hand the dangerous goods over to the carrier only if they are authorized for carriage in accordance with ADN;

- (b) He shall, when handing over for carriage packed dangerous goods or uncleaned empty packagings, check whether the packaging is damaged. He shall not hand over a package the packaging of which is damaged, especially if it is not leakproof, and there are leakages or the possibility of leakages of the dangerous substance, until the damage has been repaired; this obligation also applies to empty uncleaned packagings;
- (c) He shall, when loading dangerous goods in a vessel, a vehicle, a wagon, or a large or small container, comply with the special requirements concerning loading and handling;
- (d) He shall, after loading dangerous goods into a container comply with the requirements concerning danger markings conforming to Chapter 5.3;
- (e) He shall, when loading packages, comply with the prohibitions on mixed loading taking into account dangerous goods already in the vessel, vehicle, wagon or large container and requirements concerning the separation of foodstuffs, other articles of consumption or animal feedstuffs;
- (f) He shall ascertain that provision has been made in the fore and aft sections of the vessel for its evacuation in the event of an emergency;
- (g) *(Reserved)*

1.4.3.1.2 The loader may, however, in the case of 1.4.3.1.1 (a), (d) and (e), rely on information and data made available to him by other participants.

1.4.3.2 **Packer**

In the context of 1.4.1, the packer shall comply with in particular:

- (a) the requirements concerning packing conditions, or mixed packing conditions and,
- (b) when he prepares packages for carriage, the requirements concerning marking and labelling of the packages.

1.4.3.3 **Filler**

In the context of 1.4.1, the filler has the following obligations in particular:

Obligations concerning the filling of tanks (tank-vehicles, battery-vehicles, demountable tanks, portable tanks, tank-containers, MEGCs, tank wagons and battery wagons):

- (a) He shall ascertain prior to the filling of tanks that both they and their equipment are technically in a satisfactory condition;
- (b) He shall ascertain that the date of the next test for tanks has not expired;
- (c) He shall only fill tanks with the dangerous goods authorized for carriage in those tanks;
- (d) He shall, in filling the tank, comply with the requirements concerning dangerous goods in adjoining compartments;

- (e) He shall, during the filling of the tank, observe the maximum permissible degree of filling or the maximum permissible mass of contents per litre of capacity for the substance being filled;
- (f) He shall, after filling the tank, check the leakproofness of the closing devices;
- (g) He shall ensure that no dangerous residue of the filling substance adheres to the outside of the tanks filled by him;
- (h) He shall, in preparing the dangerous goods for carriage, ensure that the orange plates and placards or labels prescribed are affixed in accordance with the requirements of chapter 5.3 concerning tanks.

Obligations concerning the bulk loading of dangerous solids in vehicles, wagons or containers:

- (i) He shall ascertain, prior to loading, that the vehicles, wagons and containers, and if necessary their equipment, are technically in a satisfactory condition and that the carriage in bulk of the dangerous goods in question is authorized in these vehicles, wagons or containers;
- (j) He shall ensure after loading that the orange plates and placards or labels prescribed are affixed in accordance with the requirements of Chapter 5.3 applicable to such vehicles, wagons or containers;
- (k) He shall, when filling vehicles, wagons or containers with dangerous goods in bulk, ascertain that the relevant provisions of Chapter 7.3 of RID or ADR are complied with.

Obligations concerning the filling of cargo tanks:

- (l) *(Reserved)*;
- (m) He shall complete his section of the check list referred to in 7.2.4.10 prior to the loading of the cargo tanks of a tank vessel;
- (n) He shall only fill cargo tanks with the dangerous goods accepted in such tanks;
- (o) He shall, when necessary, issue a heating instruction in the case of the carriage of substances whose melting point is 0 °C or higher;
- (p) He shall ascertain that during loading the trigger for the automatic device for the prevention of overfilling switches off the electric line established and supplied by the on-shore installation and that he can take steps against overfilling;
- (q) He shall ascertain that provision has been made in the fore and aft sections of the vessel for appropriate means for its evacuation in the event of an emergency;
- (r) He shall ascertain that, when prescribed in 7.2.4.25.5. there is a flame-arrester in the gas discharge pipe or the compensation pipe to protect the vessel against detonations and flame-fronts from the landward side;
- (s) He shall ascertain that the loading flows conform to the loading instructions referred to in 9.3.2.25.9 or 9.3.3.25.9 and that the pressure at the crossing-point of the gas discharge pipe or the compensation pipe is not greater than the opening pressure of the high velocity vent valve;

- (t) He shall ascertain that the joints provided by him for the connecting flange of the ship/shore connections of the loading and unloading piping consist of a material which is not susceptible to be damaged by the cargo or causes a decomposition of the cargo nor forms harmful or dangerous components with it;
- (u) He shall ascertain that during the entire duration of loading or unloading a permanent and appropriate supervision is assured.

Obligations concerning the bulk loading of dangerous solids in vessels:

- (v) *(Reserved)*;
- (w) He shall only load the vessel with dangerous goods the bulk carriage of which is authorized in that vessel;
- (x) He shall ascertain that provision has been made in the fore and aft sections of the vessel for appropriate means for its evacuation in the event of an emergency.

1.4.3.4 *Tank-container/portable tank operator*

In the context of 1.4.1, the tank-container/portable tank operator shall in particular:

- (a) ensure compliance with the requirements for construction, equipment, tests and marking;
- (b) ensure that the maintenance of shells and their equipment is carried out in such a way as to ensure that, under normal operating conditions, the tank-container/portable tank satisfies the requirements of ADR, RID or the IMDG Code until the next inspection;
- (c) have an exceptional check made when the safety of the shell or its equipment is liable to be impaired by a repair, an alteration or an accident.

1.4.3.5 *(Reserved)*

CHAPTER 1.5

SPECIAL RULES, DEROGATIONS

1.5.1 Bilateral and multilateral agreements

- 1.5.1.1 In accordance with Article 7, paragraph 1 of ADN, the competent authorities of the Contracting Parties may agree directly among themselves to authorize certain transport operations in their territories by temporary derogation from the requirements of ADN, provided that safety is not compromised thereby. The authority which has taken the initiative with respect to the temporary derogation shall notify such derogations to the Secretariat of the United Nations Economic Commission for Europe which shall bring them to the attention of the Contracting Parties.

NOTE: "Special arrangement" in accordance with 1.7.4 is not considered to be a temporary derogation in accordance with this section.

- 1.5.1.2 The period of validity of the temporary derogation shall not be more than five years from the date of its entry into force. The temporary derogation shall automatically cease as from the date of the entry into force of a relevant amendment to these annexed Regulations.
- 1.5.1.3 Transport operations on the basis of these agreements shall constitute transport operations in the sense of ADN.

1.5.2 Special authorizations concerning transport in tank vessels

1.5.2.1 Special authorizations

- 1.5.2.1.1 In accordance with paragraph 2 of Article 7 of ADN, the competent authority shall have the right to issue special authorizations to a carrier or a consignor for the international carriage in tank vessels of dangerous substances, including mixtures, the carriage of which in tank vessels is not authorized under these Regulations, in accordance with the procedure set out below.
- 1.5.2.1.2 The special authorization shall be valid, due account being taken of the restrictions specified therein, for the Contracting Parties and on whose territory the transport operation will take place, for not more than two years but unless it is repealed at an earlier date. With the approval of the competent authorities of these Contracting Parties, the special authorization may be renewed for a period of not more than one year.
- 1.5.2.1.3 The special authorization shall include a statement concerning its repeal at an earlier date and shall conform to the model contained in subsection 3.2.4.1.

1.5.2.2 Procedure

- 1.5.2.2.1 The carrier or the consignor shall apply to the competent authority of a Contracting Party on whose territory the transport operation takes place for the issue of a special authorization.
- The application shall conform to the model contained in subsection 3.2.4.2. The applicant shall be responsible for the accuracy of the particulars.
- 1.5.2.2.2 The competent authority shall consider the application from the technical and safety point of view. If it has no reservations, it shall draw up a special authorization in accordance with the criteria contained in subsection 3.2.4.3 and immediately inform the other competent authorities involved in the carriage in question. The special authorization shall be issued only when the authorities concerned agree to it or have not expressed opposition within a

period of two months after receiving the information. The applicant shall receive the original of the special authorization and keep a copy of it on board the vessel(s) involved in the carriage in question. The competent authorities shall immediately communicate to the Administrative Committee the applications for special authorizations, the applications rejected and the special authorizations granted.

1.5.2.2.3 If the special authorization is not issued because doubts or opposition have been expressed, the Administrative Committee shall decide whether or not to issue a special authorization.

1.5.2.3 *Update of the list of substances authorized for carriage in tank vessels*

1.5.2.3.1 The Administrative Committee shall consider all the special authorizations and applications communicated to it and decide whether the substance is to be included in the list of substances in these Regulations, authorized for carriage in tank vessels.

1.5.2.3.2 If the Administrative Committee enters technical or safety reservations concerning the inclusion of the substance in the list of substances of these Regulations authorized for carriage in tank vessels or concerning certain conditions, the competent authority shall be so informed. The competent authority shall immediately withdraw or, if necessary, modify the special authorization.

1.5.3 **Equivalents and derogations (Article 7, paragraph 3 of ADN)**

1.5.3.1 *Procedure for equivalents*

When the provisions of these Regulations prescribe for a vessel the use or the presence on board of certain materials, installations or equipment or the adoption of certain construction measures or certain fixtures, the competent authority may agree to the use or the presence on board of other materials, installations or equipment or the adoption of other construction measures or other fixtures for this vessel if, in line with recommendations established by the Administrative Committee, they are accepted as equivalent.

1.5.3.2 *Derogations on a trial basis*

The competent authority may, on the basis of a recommendation by the Administrative Committee, issue a trial certificate of approval for a limited period for a specific vessel having new technical characteristics departing from the requirements of these Regulations, provided that these characteristics are sufficiently safe.

1.5.3.3 *Particulars of equivalents and derogations*

The equivalents and derogations referred to in 1.5.3.1 and 1.5.3.2 shall be entered in the certificate of approval.

CHAPTER 1.6

TRANSITIONAL MEASURES

1.6.1 General

- 1.6.1.1 Unless otherwise provided, the substances and articles of ADN may be carried until 30 June 2009 in accordance with the requirements of ADN applicable up to 31 December 2008.
- 1.6.1.2 (a) The danger labels and placards which until 31 December 2004 conformed to models No. 7A, 7B, 7C, 7D or 7E prescribed up to that date may be used until 31 December 2010.
- (b) The danger labels and placards which until 31 December 2006 conformed to model No. 5.2 prescribed up to that date may be used until 31 December 2010.
- 1.6.1.3 The transitional measures of 1.6.1.3 and 1.6.1.4 of ADR and RID, or falling within the scope of 4.1.5.19 of IMDG Code, concerning the packaging of substances and articles of Class 1, are also valid for carriage subject to ADN.
- 1.6.1.4-1.6.1.7 *(Reserved)*
- 1.6.1.8 Existing orange-coloured plates which meet the requirements of sub-section 5.3.2.2 applicable up to 31 December 2004 may continue to be used.
- 1.6.1.9 *(Reserved)*
- 1.6.1.10 Lithium cells and batteries manufactured before 1 July 2003 which had been tested in accordance with the requirements applicable until 31 December 2002 but which had not been tested in accordance with the requirements of ADR or RID applicable as from 1 January 2003, and appliances containing such lithium cells or batteries, may continue to be carried up to 30 June 2013 if all the other applicable requirements are fulfilled.
- 1.6.1.11-12 *(Reserved)*
- 1.6.1.13 Plates in accordance with the provisions of 5.3.2.2.1 and 5.3.2.2.2 applicable until 31 December 2008 may be used until 31 December 2009.
- 1.6.1.14 IBCs manufactured before 1 January 2011 in accordance with the requirements in force up to 31 December 2010 and conforming to a design type which has not passed the vibration test of 6.5.6.13 of ADR may still be used.
- 1.6.1.15 IBCs manufactured, remanufactured or repaired before 1 January 2011 need not be marked with the maximum permitted stacking load in accordance with 6.5.2.2.2 of ADR. Such IBCs, not marked in accordance with 6.5.2.2.2 of ADR, may still be used after 31 December 2010 but must be marked in accordance with 6.5.2.2.2 of ADR if they are remanufactured or repaired after that date.
- 1.6.1.16 Animal material affected by pathogens included in Category B, other than those which would be assigned to Category A if they were in culture (see 2.2.62.1.12.2), may be carried

in accordance with provisions determined by the competent authority until 31 December 2014.¹

1.6.1.17 For carriage in packages, substances of classes 1 to 9 other than those assigned to UN Nos. 3077 or 3082 to which the classification criteria of 2.2.9.1.10 have not been applied and which are not marked in accordance with 5.2.1.8 and 5.3.6 may still be carried until 31 December 2010 without application of the provisions concerning the carriage of environmentally hazardous substances.

1.6.1.18 The provisions of sections 3.4.9 to 3.4.13 need only be applied as from 1 January 2011.

1.6.2 Pressure receptacles and receptacles for Class 2

The transitional measures of sections 1.6.2 of ADR and RID are also valid for transport operations subject to ADN.

1.6.3 Fixed tanks (tank-vehicles and tank wagons), demountable tanks, battery vehicles and battery wagons

The transitional measures of sections 1.6.3 of ADR and RID are also valid for transport operations subject to ADN.

1.6.4 Tank-containers, portable tanks and MEGCs

The transitional measures of sections 1.6.4 of ADR and RID or of section 4.2.0 of the IMDG Code, depending on the case, are also valid for transport operations subject to ADN.

1.6.5 Vehicles

The transitional measures of section 1.6.5 of ADR are also valid for transport operations subject to ADN.

1.6.6 Class 7

The transitional measures of sections 1.6.6 of ADR and RID or of section 6.4.24 of the IMDG Code are also valid for transport operations subject to ADN.

1.6.7 Transitional provisions concerning vessels

1.6.7.1 General

1.6.7.1.1 For the purposes of Article 8 of ADN, section 1.6.7 sets out general transitional provisions in 1.6.7.2 (see Article 8, paragraphs 1, 2 and 4) and supplementary transitional provisions in 1.6.7.3 (see Article 8, paragraph 3).

1.6.7.1.2 In this section:

- (a) "Vessel in service" means a vessel according to Article 8, paragraph 2 of ADN;
- (b) "N.R.M." means that the requirement does not apply to vessels in service except where the parts concerned are replaced or modified, i.e. it applies only to vessels which are

¹ Regulations for dead infected animals are contained e.g. in Regulation (EC) No. 1774/2002 of the European Parliament and of the Council of 3 October 2002 laying down health rules concerning animal by-products not intended for human consumption (Official Journal of the European Communities, No. L 273 of 10.10.2002, p. 1).

new (as from the date indicated), or to parts which are replaced or modified after the date indicated; where existing parts are replaced by spare or replacement parts of the same type and manufacture, this shall not be considered a replacement 'R' as defined in these transitional provisions.

Modification shall also be taken to mean the conversion of an existing type of tank vessel, a type of cargo tank or a cargo tank design to another type or design at a higher level.

- (c) "Renewal of the certificate of approval after the ..." means that the requirement shall be met at the next renewal of the certificate of approval following the date indicated. If the certificate of approval expires during the first year after the date of application of these Regulations, the requirement shall be mandatory only after the expiry of this first year.

1.6.7.2 *General transitional provisions*

1.6.7.2.1 *General transitional provisions for dry cargo vessels*

1.6.7.2.1.1 Vessels in service shall meet:

- (a) the requirements of paragraphs mentioned in the table below within the period established therein;
- (b) the requirements of paragraphs not mentioned in the table below at the date of application of these Regulations.

The construction and equipment of vessels in service shall be maintained at least at the previous standard of safety.

1.6.7.2.1.1 Table of general transitional provisions: Dry cargo		
Paragraphs	Subject	Time limit and comments
9.1.0.12.1	Ventilation of holds	N.R.M. The following requirements apply on board vessels in service: Each hold shall have appropriate natural or artificial ventilation; for the carriage of substances of Class 4.3, each hold shall be equipped with forced-air ventilation; the appliances used for this purpose must be so constructed that water cannot enter the hold.
9.1.0.12.3	Ventilation of service spaces	N.R.M.
9.1.0.17.2	Gas-tight openings facing holds	N.R.M. The following requirements apply on board vessels in service: Openings of accommodation and the wheelhouse facing the holds must be capable of being tightly closed.
9.1.0.17.3	Entrances and openings in the protected area	N.R.M. The following requirements apply on board vessels in service: Openings of accommodation and the wheelhouse facing holds shall be capable of being tightly closed.
9.1.0.31.2	Air intakes of engines	N.R.M.
9.1.0.32.2	Air pipes 50 cm above the deck	N.R.M.
9.1.0.34.1	Position of exhaust pipes	N.R.M.
9.1.0.35	Stripping pumps in the protected area	N.R.M. The following requirements apply on board vessels in service: In the event of the carriage of substances of Class 4.1, UN No. 3175, of all substances of Class 4.3 in bulk or unpackaged and polymeric beads, expandable, of Class 9, UN No. 2211, the stripping of the holds may only be effected using a stripping installation located in the protected area. The stripping installation located above the engine room must be clamped.
9.1.0.40.1	Fire extinguishers, two pumps, etc.	N.R.M.
9.1.0.40.2	Fire extinguishing systems permanently fixed in engine rooms	N.R.M.

1.6.7.2.1.1 Table of general transitional provisions: Dry cargo		
Paragraphs	Subject	Time limit and comments
9.1.0.41 in conjunction with 7.1.3.41	Fire and naked light	N.R.M. The following requirements apply on board vessels in service: The outlets of funnels shall be located not less than 2.00 m from the nearest point on hold hatchways. Heating and cooking appliances shall be permitted only in metal-based accommodation and wheelhouses. However: Heating appliances fuelled with liquid fuels having a flashpoint above 55 °C shall be permitted in engine rooms; Central-heating boilers fuelled with solid fuels shall be permitted in spaces situated below deck and accessible only from the deck.
9.2.0.31.2	Air intakes of engines	N.R.M.
9.2.0.34.1	Position of exhaust pipes	N.R.M.
9.2.0.41 in conjunction with 7.1.3.4.1	Fire and naked light	N.R.M. The following requirements apply on board vessels in service: Outlets of funnels shall be located not less than 2.00 m from the nearest point on hold hatchways. Heating and cooking appliances shall be permitted only in metal-based accommodation and wheelhouses. However: Heating appliances fuelled with liquid fuels having a flashpoint above 55° C shall be permitted in engine rooms; Central-heating boilers fuelled by solid fuels shall be permitted in spaces situated below the deck and accessible only from the deck.

1.6.7.2.1.2 (Deleted)

1.6.7.2.2 General transitional provisions for tank vessels

1.6.7.2.2.1 Vessels in service shall meet:

- (a) the requirements of paragraphs mentioned in the table below within the period established therein;
- (b) the requirements of paragraphs not mentioned in the table below at the date of application of these Regulations.

The construction and equipment of vessels in service shall be maintained at least at the previous standard of safety.

1.6.7.2.2.2 Table of general transitional provisions for tank vessels

1.6.7.2.2.2 Table of general transitional provisions: Tank vessels		
Paragraphs	Subject	Time limit and comments
1.2.1	Limited explosion risk electrical apparatus	N.R.M. The following requirements apply on board vessels in service: Limited explosion risk electrical apparatus is: – Electrical apparatus which, during normal operation, does not cause sparks or exhibit surface temperatures exceeding 200 °C; or – Electrical apparatus with a spray-water protected housing which, during normal operation, does not exhibit surface temperatures above 200 °C.
1.2.1	Hold space	Not applicable to Type N open vessels whose hold spaces contain auxiliary appliances and which are carrying only substances of Class 8, with remark 30 in column (20) of Table C of Chapter 3.2.
1.2.1	Flame arrester High velocity vent valve according to standard EN 12 874 (1999)	N.R.M. The following requirements are applicable on board vessels in service: Flame arresters and high velocity vent valves shall be of a type approved by the competent authority for the use prescribed.
7.2.2.6	Approved gas detection system	N.R.M.
7.2.2.19.3	Vessels used for propulsion	N.R.M.
7.2.3.20	Use of cofferdams for ballasting	On board vessels in service, cofferdams may be filled with water during unloading to provide trim and to permit residue-free drainage if possible.
7.2.3.20.1	Ballast water Prohibition against filling cofferdams with water	N.R.M. The following requirements apply on board vessels in service: Cofferdams may be filled with ballast water only when cargo tanks are empty.
7.2.3.20.1	Proof of stabilization in the event of a leak connected with ballast water for Type G vessels	N.R.M.
7.2.3.25.1 (c)	Connections prohibited between pipes for loading and unloading and pipes located outside the cargo area	N.R.M. for oil-separator vessels
7.2.3.31.2	Motor vehicles only outside the cargo area: Type N open	N.R.M. The following requirements apply on board vessels in service: The vehicle shall not be started on board.
7.2.3.42.3	Use of the cargo heating system	Not applicable to vessels in service of Type N open.
7.2.3.51.3	Live sockets for Type G and Type N vessels	N.R.M.
7.2.4.16.15	Start of loading flow	N.R.M.
7.2.4.22.1	Opening of openings Type N open	N.R.M. On board vessels in service cargo tank hatches may be opened during loading for control and sampling.

1.6.7.2.2.2 Table of general transitional provisions: Tank vessels		
Paragraphs	Subject	Time limit and comments
8.1.2.3 (c)	Damage control plan: Type G	N.R.M.
8.1.2.3 (c)	Documents concerning intact stability	N.R.M.
8.1.2.3 (i)	Loading and unloading instructions	N.R.M.
8.1.6.2	Compliance of hoses and hose assemblies with standards EN 12115:1999, EN 13765:2003, EN ISO 10380:2003	Hoses and hose assemblies on board at 1 January 2007 which do not comply with the applicable standards may be used up to 31 December 2009 at the latest
9.3.2.0.1 (c) 9.3.3.0.1 (c)	Protection of vapour pipes against corrosion	N.R.M.
9.3.1.0.3 (d) 9.3.2.0.3 (d) 9.3.3.0.3 (d)	Fire-resistant materials of accommodation and wheelhouse	N.R.M.
9.3.3.8.1	Classification of Type N open vessels with flame arresters and Type N open vessels	N.R.M.
9.3.3.8.1	Continuation of class for Type N open vessels with flame arresters and Type N open vessels	N.R.M. The following requirements apply on board vessels in service: Except where otherwise provided, the type of construction, the strength, the subdivision, the equipment and the gear of the vessel shall conform or be equivalent to the construction requirements for classification in the highest class of a recognized classification society.
9.3.1.10.2 9.3.2.10.2 9.3.3.10.2	Door coamings, etc.	N.R.M. The following requirements apply on board vessels in service, with the exception of Type N open vessels: This requirement may be met by fitting vertical protection walls not less than 0.50 m in height; On board vessels in service less than 50.00 m long, the height of 0.50 m may be reduced to 0.30 m in passageways leading to the deck.
9.3.1.10.3 9.3.2.10.3 9.3.3.10.3	Height of sills of hatches and openings above the deck	N.R.M.
9.3.1.11.1 (b)	Ratio of length to diameter of pressure cargo tanks	Not applicable to Type G vessels whose keels were laid before 1 January 1977.
9.3.3.11.1 (d)	Limitation of length of cargo tanks	N.R.M.

1.6.7.2.2 Table of general transitional provisions: Tank vessels		
Paragraphs	Subject	Time limit and comments
9.3.1.11.2 (a)	Arrangement of cargo tanks Distance between cargo tanks and side walls	N.R.M. Not applicable to Type G vessels whose keels were laid before 1 January 1977.
	Height of saddles, spacers	N.R.M. The following requirements apply on board vessels in service: Where tank volume is more than 200 m ³ or where the ratio of length to diameter is less than 7 but more than 5, the hull in the tank area shall be such that, in the event of a collision, the tanks remain intact as far as possible. This requirement shall be considered as having been met where, in the tank area, the vessel: <ul style="list-style-type: none"> – is double-hulled with a distance of at least 80 cm between the side plating and the longitudinal bulkhead, – or is designed as follows: <ul style="list-style-type: none"> (a) Between the gangboard and the top of the floorplates there shall be side stringers at regular intervals of not more than 60 cm; (b) The side struts shall be supported by web frames spaced at intervals of not more than 2.00 m. The height of the web frames shall be not less than 10% of the depth and in any event not less than 30 cm. They shall be fitted with a face plate made of flat steel having a cross section of not less than 15 cm²; (c) The side stringers referred to in (a) shall have the same height as the web frames and be fitted with a face plate made of flat steel having a cross section of not less than 7.5 cm².
9.3.1.11.2 (b) 9.3.2.11.2 (b) 9.3.3.11.2 (a)	Cargo tank fastenings	N.R.M.
9.3.1.11.2 (c) 9.3.2.11.2 (c) 9.3.3.11.2 (b)	Capacity of suction well	N.R.M.
9.3.1.11.2 (d) 9.3.2.11.2 (d)	Side struts between the hull and the cargo tanks	N.R.M.
9.3.1.11.3 (a)	End bulkheads of cargo area with “A-60” insulation. Distance of 0.50 m from cargo tanks in hold spaces	N.R.M.

1.6.7.2.2.2 Table of general transitional provisions: Tank vessels		
Paragraphs	Subject	Time limit and comments
9.3.2.11.3 (a) 9.3.3.11.3 (a)	Width of cofferdams of 0.60 m Hold spaces with cofferdams or "A-60" insulated bulkheads Distance of 0.50 m from cargo tanks in hold spaces	N.R.M. The following requirements apply on board vessels in service: Type C: minimum width of cofferdams: 0.50 m; Type N: minimum width of cofferdams: 0.50 m, on board vessels with a deadweight of up to 150 t: 0.40 m; Type N open: cofferdams shall not be required with deadweight up to 150 t: The distance between cargo tanks and end bulkheads of hold spaces shall be at least 0.40 m.
9.3.3.11.4	Passages through the end bulkheads of hold spaces	Shall not apply to Type N open vessels whose keels were laid before 1 January 1977.
9.3.3.11.4	Distance of piping in relation to the bottom	N.R.M.
9.3.3.11.6 (a)	Form of cofferdam arranged as a pump room	Shall not apply to Type N vessels whose keels were laid before 1 January 1977.
9.3.1.11.7 9.3.3.11.8	Arrangement of service spaces located in the cargo area below decks	N.R.M.
9.3.3.11.7	Distance between the cargo tanks and the outer wall of the vessel Width of double hull Distance between the suction well and the bottom spaces	N.R.M. after 01-01-2001 Renewal of certificate of approval after 31-12-2038 N.R.M. after 01-01-2007 Renewal of certificate approval after 31-12-2038 N.R.M. after 01-01-2003 Renewal of certificate of approval after 01-01-2038
9.3.3.11.7	Hold spaces	N.R.M. after 1 January 2007 The following requirements are applicable to vessels with a certificate of approval valid prior to 1 January 2007: Where a vessel is constructed with hold spaces containing cargo tanks which are independent of the structure of the vessel, the space between the wall of the hold space and the wall of the cargo tanks shall be not less than 0.60 m. The space between the bottom of the hold space and the bottom of the cargo tanks shall be not less than 0.50 m. The space may be reduced to 0.40 m under the pump sumps. The space between the suction well and the bottom structures shall be not less than 0.10 m. If the above-mentioned spaces are not feasible, it shall be possible to remove the cargo tanks easily for inspections.

1.6.7.2.2 Table of general transitional provisions: Tank vessels		
Paragraphs	Subject	Time limit and comments
9.3.1.11.8 9.3.3.11.9	Dimensions of openings for access to spaces within the cargo area	N.R.M.
9.3.1.11.8 9.3.2.11.10 9.3.3.11.9	Interval between reinforcing elements	N.R.M.
9.3.2.12.1 9.3.3.12.1	Ventilation opening in hold spaces	N.R.M.
9.3.1.12.2 9.3.3.12.2	Ventilation systems in double-hull spaces and double bottoms	N.R.M.
9.3.1.12.3 9.3.2.12.3 9.3.3.12.3	Height above the deck of the air intake for service spaces located below deck	N.R.M.
9.3.1.12.6 9.3.2.12.6 9.3.3.12.6	Distance of ventilation inlets from cargo area	N.R.M.
9.3.1.12.6 9.3.2.12.6 9.3.3.12.6	Permanently installed flame screens	N.R.M.
9.3.3.12.7	Approval of flame arresters	Shall not apply to Type N vessels whose keels were laid before 1 January 1977.
9.3.1.13 9.3.3.13	General stability	N.R.M.
9.3.3.13.3 paragraph 2	Stability (general)	N.R.M. after 1 January 2007
9.3.1.14 9.3.3.14	Intact stability	N.R.M.
9.3.2.14.2	Stability (intact)	N.R.M.
9.3.3.14.2 (b) and (c)	Stability (intact)	N.R.M. after 1 January 2007
9.3.3.15	Stability (damaged condition)	N.R.M.
9.3.3.15	Stability (damaged condition)	N.R.M. after 01-01-2007 Renewal of certificate of approval after 01-01-2038
9.3.1.16.1 9.3.3.16.1	Distance of openings of engine rooms from the cargo area	N.R.M.
9.3.3.16.1	Internal combustion engines outside the cargo area for Type N open vessels	N.R.M.
9.3.1.16.2 9.3.3.16.2	Hinges of doors facing the cargo area	Shall not apply to vessels whose keels were laid before 1 January 1977 where alterations would obstruct other major openings.
	Engine rooms accessible from the deck for Type N open vessels	N.R.M.

1.6.7.2.2 Table of general transitional provisions: Tank vessels		
Paragraphs	Subject	Time limit and comments
9.3.1.17.1 9.3.3.17.1	Accommodation and wheelhouse outside the cargo area	Shall not apply to vessels whose keels were laid before 1 January 1977, provided that there is no connection between the wheelhouse and other enclosed spaces. Shall not apply to vessels up to 50 m in length whose keels were laid before 1 January 1977 and whose wheelhouses are located in the cargo area even if it provides access to another enclosed space, provided that safety is ensured by appropriate service requirements of the competent authority.
	Type N open	N.R.M.
9.3.1.17.2 9.3.2.17.2 9.3.3.17.2	Arrangement of entrances and openings of forward superstructures	N.R.M.
	Entrances facing the cargo area	Shall not apply to vessels up to 50.00 m in length whose keels were laid before 1 January 1977, provided that gas screens are installed.
	Entrances and openings on Type N open vessels	N.R.M.
9.3.3.17.3	Entrances and openings must be capable of being closed Type N open	N.R.M.
9.3.1.17.4 9.3.3.17.4	Distance of openings from the cargo area	N.R.M.
9.3.3.17.5 (b), (c)	Approval of shaft passages and displaying of instructions Type N open	N.R.M.
9.3.1.17.6 9.3.3.17.6	Pump-room below deck	N.R.M. The following requirements apply on board vessels in service: Pump-rooms below deck shall meet the requirements for service spaces: - for Type G vessels: 9.3.1.12.3 for Type N vessels: 9.3.3.12.3; - be equipped with a gas detection system referred to in 9.3.1.17.6 or 9.3.3.17.6.
9.3.2.20.1 9.3.3.20.1	Access and ventilation openings 0.50 m above the deck	N.R.M.
9.3.2.20.2 9.3.3.20.2	Intake valve	N.R.M.
9.3.3.20.2	Filling of cofferdams with pump	N.R.M.
	Type N open	
9.3.2.20.2 9.3.3.20.2	Filling of cofferdams within 30 minutes	N.R.M.

1.6.7.2.2.2 Table of general transitional provisions: Tank vessels		
Paragraphs	Subject	Time limit and comments
9.3.3.21.1 (b)	Liquid level gauge Type N open with flame-arrester and Type N open	N.R.M. On board vessels in service fitted with gauging openings, such openings shall: - be arranged so that the degree of filling can be measured using a sounding rod; - be fitted with an automatically-closing cover.
9.3.3.21.1 (c)	Level alarm device	Not applicable to open Type N vessels in service permitted only to carry SULPHUR, MOLTEN, UN No. 2448.
9.3.1.21.1.(d) 9.3.2.21.1 (d) 9.3.3.21.1 (d)	Sensor for actuating the facility against overflowing	Applicable only to vessels to be loaded in a Contracting Party where the shore installation is equipped accordingly.
9.3.2.21.1.(e) 9.3.3.21.1.(e)	Instrument for measuring pressure in the cargo tank	Up to 31 December 2010 on board vessels in service which do not carry substances for which remarks 5, 6 or 7 are included in column (20) of Table C of Chapter 3.2, the instrument for measuring pressure in the cargo tank conforms to requirements when the vapour pipe is equipped with such an instrument at its front and rear extremities.
9.3.3.21.1 (g)	Sampling opening Type N open	N.R.M.
9.3.1.21.4 9.3.2.21.4 9.3.3.21.4	Independent liquid-level alarm device	N.R.M.
9.3.1.21.5 (a) 9.3.2.21.5 (a) 9.3.3.21.5 (a)	Socket close to the shore connections and cut-out of vessel's pump	N.R.M.
9.3.1.21.5 (b) 9.3.2.21.5 (b) 9.3.3.21.5 (d)	Installation of on-board pump switch-off from the shore	Renewal of the certificate of approval after 1 January 2007
9.3.2.21.5 (c)	Device for rapid shutting off of supply	Renewal of the certificate of approval after 31 December 2008
9.3.1.21.7 9.3.2.21.7 9.3.3.21.7	Vacuum or over-pressure alarms in cargo tanks for the carriage of substances without remark 5 in column (20) of Table C of Chapter 3.2.	N.R.M.
9.3.2.21.7 9.3.3.21.7	Vacuum or over-pressure alarms in cargo tanks for the carriage of substances with remark 5 in column (20) of Table C of Chapter 3.2.	N.R.M. Vessels furnished with a certificate of approval valid at 31 December 2000 shall meet these requirements no later than 31 December 2010.
9.3.1.21.7 9.3.2.21.7 9.3.3.21.7	Temperature alarms in cargo tanks	N.R.M.
9.3.3.21.12	Self-closing lid	N.R.M.
9.3.1.22.1 (b)	Distance of cargo tank openings above the deck	N.R.M.
9.3.3.22.1 (b)	Cargo tank openings 0.50 m above the deck	Shall not apply to vessels whose keels were laid before 1 January 1977.

1.6.7.2.2 Table of general transitional provisions: Tank vessels		
Paragraphs	Subject	Time limit and comments
9.3.1.22.4	Prevention of spark-formation by closure devices	N.R.M.
9.3.1.22.3 9.3.2.22.4 (b) 9.3.3.22.4 (b)	Position of outlets of valves above the deck	N.R.M.
9.3.2.22.4 (b) 9.3.3.22.4 (b)	Pressure setting of high velocity vent valves	N.R.M.
9.3.2.22.5 9.3.3.22.5	Flame arrester or Valves or Individual gas discharge pipe or Shut-off devices	N.R.M. Vessels furnished with a certificate of approval valid at 31 December 1998 shall meet these requirements no later than 31 December 2010
9.3.2.22.5 (a)	Fire-fighting installation	31 December 2010
9.3.3.23.2	Test pressure for cargo tanks	Shall not apply to vessels whose keels were laid before 1 January 1977, for which a test pressure of 15 kPa (0.15 bar) is required. A test pressure of 10 kPa (0.10 bar) shall be sufficient. On board oil-separator vessels in service before 1 January 1999, a test pressure of 5 kPa (0,05 bar) is sufficient.
9.3.3.23.3	Test pressure for pipes for loading and unloading	On board oil-separator vessels in service before 1 January 1999 a test pressure of 400 kPa is sufficient.
9.3.2.25.1 9.3.3.25.1	Shut-down of cargo pumps	N.R.M.
9.3.1.25.1 9.3.2.25.1 9.3.3.25.1	Distance of pumps, etc. from accommodation, etc.	N.R.M.
9.3.3.25.2 (a)	Pipes for loading and unloading located in the below-deck area	N.R.M. for oil-separator vessels
9.3.1.25.2 (d) 9.3.2.25.2 (d)	Position of loading and unloading pipes on deck	N.R.M.
9.3.1.25.2 (e) 9.3.2.25.2 (e) 9.3.3.25.2 (e)	Distance of shore connections from accommodation, etc.	N.R.M.
9.3.2.25.2 (g)	Pipes for loading and unloading, and vapour pipes, shall not have flexible connections fitted with sliding seals	N.R.M. after 31-12-2008 On board vessels in service having connections with sliding seals, substances with toxic or corrosive properties (see column (5) of Table C of Chapter 3.2, hazards 6.1 and 8) may no longer be transported following renewal of the certificate of approval after 31-12-2008.
9.3.3.25.2 (h)	Pipes for loading and unloading, and vapour pipes, shall not have flexible connections fitted with sliding seals when substances with corrosive properties (see column (5) of Table C of Chapter 3.2, hazard 8) are transported	N.R.M. after 31-12-2008 On board vessels in service having connections with sliding seals, substances with corrosive properties (see column (5) of Table C of Chapter 3.2, hazard 8) may no longer be transported following renewal of the certificate of approval after 31-12-2008.
9.3.1.25.2 (i) 9.3.2.25.2.(j) 9.3.3.25.2 (k)	Position of cargo piping	N.R.M.

1.6.7.2.2 Table of general transitional provisions: Tank vessels		
Paragraphs	Subject	Time limit and comments
9.3.2.25.8 (a)	Ballasting suction pipes located within the cargo area but outside the cargo tanks	N.R.M.
9.3.2.25.9 9.3.3.25.9	Loading and unloading flow	N.R.M. The loading flows mentioned in the certificate of approval shall be checked if necessary when the certificate of approval is renewed.
9.3.3.25.12	9.3.3.25.1 (a) and (c), 9.3.3.25.2 (e), 9.3.3.25.3 and 9.3.3.25.4 (a) are not applicable with the exception of Type N open carrying corrosive substances (see Chapter 3.2, Table C, column (5), hazard 8)	N.R.M. This time limit concerns only Type N open vessels carrying corrosive substances (see Chapter 3.2, Table C, column (5), hazard 8).
9.3.1.27.2	Refrigeration system List of 12° instead of 10°	N.R.M.
9.3.2.28	Water-spray installation required in Table C of Chapter 3.2	Renewal of the certificate of approval after 31 December 2004.
9.3.1.31.2 9.3.2.31.2 9.3.3.31.2	Distance of engine air intakes from the cargo area	N.R.M.
9.3.1.31.4 9.3.2.31.4 9.3.3.31.4	Temperature of outer parts of engines, etc.	N.R.M. The following requirements apply on board vessels in service: The temperature of outer parts shall not exceed 300° C.
9.3.1.31.5 9.3.2.31.5 9.3.3.31.5	Temperature in the engine room	N.R.M. The following requirements apply on board vessels in service: The temperature in the engine room shall not exceed 45 °C.
9.3.1.32.2 9.3.2.32.2 9.3.3.32.2	Openings of air pipes 0.50 m above the deck	N.R.M.
9.3.3.34.1	Exhaust pipes	N.R.M.
9.3.1.35.1 9.3.3.35.1	Stripping and ballast pumps in the cargo area	N.R.M.
9.3.3.35.3	Suction pipes for ballasting located within the cargo area but outside the cargo tanks	N.R.M.
9.3.1.35.4	Stripping installation of the pump-room outside the pump-room	N.R.M.
9.3.1.40.1 9.3.2.40.1 9.3.3.40.1	Fire extinguishing systems, two pumps, etc.	N.R.M.
9.3.1.40.2 9.3.2.40.2 9.3.3.40.2	Fixed fire extinguishing system in engine room	N.R.M.

1.6.7.2.2 Table of general transitional provisions: Tank vessels		
Paragraphs	Subject	Time limit and comments
9.3.1.41.1 9.3.3.41.1	Outlets of funnels located not less than 2 m from the cargo area	Not applicable to vessels whose keels were laid before 1 January 1977.
9.3.3.41.1	Outlets of funnels	N.R.M. for oil-separator vessels
9.3.1.41.2 9.3.2.41.3 9.3.3.41.2 in conjunction with 7.2.3.41	Heating, cooking and refrigerating appliances	N.R.M.
9.3.3.42.2	Cargo heating system: Type N open	N.R.M. The following requirements apply on board vessels in service: This can be achieved by an oil separator fitted to the condensed water return pipe.
9.3.1.51.2 9.3.2.51.2 9.3.3.51.2	Visual and audible alarm	N.R.M.
9.3.1.51.3 9.3.2.51.3 9.3.3.51.3	Temperature class and explosion group	N.R.M.
9.3.3.52.1 (b), (c), (d) and (e)	Electrical installations: Type N open	N.R.M.
9.3.1.52.1 (e) 9.3.3.52.1 (e)	Electrical installations of the "certified safe" type in the cargo area	Shall not apply to vessels whose keels were laid before 1 January 1977. The following conditions shall be met during loading, unloading and gas-freeing on board vessels having non-gastight wheelhouse openings (e.g. doors, windows, etc.) giving on to the cargo area: (a) All electrical installations designed to be used shall be of a limited explosion-risk type, i.e. they shall be so designed that there is no sparking under normal operating conditions and the temperature of their outer surfaces does not rise above 200° C, or be of a type protected against water spray the temperature of whose outer surfaces does not exceed 200° C under normal operating conditions; (b) Electrical installations which do not meet the requirements of (a) above shall be marked in red and it shall be possible to switch them off by means of a central switch.
9.3.3.52.2	Accumulators located outside the cargo area Type N open	N.R.M.

1.6.7.2.2 Table of general transitional provisions: Tank vessels		
Paragraphs	Subject	Time limit and comments
9.3.1.52.3 (a) 9.3.1.52.3 (b) 9.3.3.52.3 (a) 9.3.3.52.3 (b)	Electrical installations used during loading, unloading or gas-freeing	Shall not apply to the following installations on vessels whose keels were laid before 1 January 1977: Lighting installations in accommodation, with the exception of switches near the entrances to accommodation; Radio telephone installations in accommodation and wheelhouses and combustion engine control appliances. All other electrical installations shall meet the following requirements: (a) Generators, engines, etc. IP13 protection mode (b) Control panels, lamps, etc. IP23 protection mode (c) Appliances, etc. IP55 protection mode.
	Type N open	N.R.M.
9.3.1.52.3 (b) 9.3.2.52.3 (b) 9.3.3.52.3 (b) in conjunction with 3 (a)	Electrical installations used during loading, unloading and gas-freeing	N.R.M. On board vessels in service, paragraph (3) (a) shall not apply to: – Lighting installations in accommodation, with the exception of switches near entrances to accommodation; – Radiotelephone installations in accommodation and wheelhouses.
9.3.1.52.4 9.3.2.52.4 9.3.3.52.4 last sentence	Disconnection of such installations from a centralized location	N.R.M.
9.3.3.52.4	Red mark on electrical installations Type N open	N.R.M.
9.3.3.52.5	Cut-out switch for continuously driven generator: Type N open	N.R.M.
9.3.3.52.6	Permanently fitted sockets: Type N open	N.R.M.
9.3.1.56.1 9.3.3.56.1	Metallic sheaths for all cables in the cargo area	Shall not apply to vessels whose keels were laid before 1 January 1977.
9.3.3.56.1	Metallic sheath for all cables in the cargo area	N.R.M. for oil-separator vessels
9.3.1.56.3 9.3.2.56.3 9.3.3.56.3	Movable cables in the cargo area	N.R.M.

1.6.7.2.2.3 Transitional provisions concerning the application of the requirements of Table C of Chapter 3.2 to the carriage of goods in tank vessels.

1.6.7.2.2.3.1 The goods for which Type N closed with a minimum valve setting of 10 kPa (0.10 bar) is required in Table C of Chapter 3.2, may be carried in tank-vessels in service of Type N

closed with a minimum valve setting of 6 kPa (0.06 bar) (cargo tank test pressure of 10 kPa (0.10 bar)).

1.6.7.2.2.3.2 (Remark 5)

On board tank vessels in service, the dismantling of the fixed plate stacks of flame arresters is permitted in the event of the carriage of substances for which remark 5 is included in column (20) of Table C of Chapter 3.2. This transitional provision is valid until 31 December 2010.

1.6.7.2.2.3.3 (Remarks 6 and 7)

On board tank vessels in service vapour pipes and pressure/vacuum valves do not need to be heated in the event of the carriage of substances for which remarks 6 or 7 are included in column (20) of Table C of Chapter 3.2. This transitional provision is valid until 30 December 2010.

On board tank vessels equipped with flame arresters with fixed plate stacks, the latter may be dismantled in the event of the carriage of the above-mentioned substances. This transitional provision is valid until 31 December 2010.

1.6.7.3 *Supplementary transitional provisions applicable to specific inland waterways*

Vessels in service to which the transitional provisions of this subsection are applied shall meet:

- the requirements of paragraphs and subparagraphs mentioned in the table below and in the table of general transitional provisions (see 1.6.7.2.1.1 and 1.6.7.2.3.1) within the period established therein;
- the requirements of paragraphs and subparagraphs not mentioned in the table below or in the table of general transitional provisions at the date of application of these Regulations.

The construction and equipment of vessels in service shall be maintained at least at the previous standard of safety.

Table of supplementary transitional provisions		
Paragraph	Subject	Time limit and comments
9.1.0.11.1 (b)	Holds, common bulkheads with oil fuel tanks	N.R.M. The following requirements apply on board vessels in service: Holds may share a common bulkhead with the oil fuel tanks, provided that the cargo or its packaging does not react chemically with the fuel.
9.1.0.92	Emergency exit	N.R.M. The following requirements apply on board vessels in service: Spaces the entrances or exits of which are partly or fully immersed in damaged condition shall be provided with an emergency exit not less than 0.075 m above the damage waterline.

Table of supplementary transitional provisions		
Paragraph	Subject	Time limit and comments
9.1.0.95.1 (c)	Height of openings above damage waterline	N.R.M. The following requirements apply on board vessels in service: The lower edge of any non-watertight openings (e.g. doors, windows, access hatchways) shall, at the final stage of flooding, be not less than 0.075 m above the damage waterline.
9.1.0.95.2 9.3.2.15.2	Extent of the stability diagram (damaged condition)	N.R.M. The following requirements apply on board vessels in service: At the final stage of flooding the angle of heel shall not exceed: 20° before measures to right the vessel; 12° following measures to right the vessel.
9.3.1.11.1 (a) 9.3.2.11.1 (a) 9.3.3.11.1 (a)	Maximum capacity of cargo tanks	N.R.M. The following requirements apply on board vessels in service: The maximum permissible capacity of a cargo tank shall be 760 m ³ .
9.3.2.11.1 (d)	Length of cargo tanks	N.R.M. The following requirements apply on board vessels in service: The length of a cargo tank may exceed 10 m and 0.2 L.
9.3.1.12.3 9.3.2.12.3 9.3.3.12.3	Position of air inlets	N.R.M. The following requirements apply on board vessels in service: The air inlets to be positioned at least 5.00 m from the safety-valve outlets
9.3.2.15.1 (c)	Height of openings above damage waterline	N.R.M. The following requirements apply on board vessels in service: The lower edge of any non-watertight openings (e.g. doors, windows, access hatchways) shall, at the final stage of flooding, be not less than 0.075 m above the damage waterline.
9.3.2.20.2 9.3.3.20.2	Filling of cofferdams with water	N.R.M. The following requirements apply on board vessels in service: Cofferdams shall be fitted with a system for filling with water or inert gas.

Table of supplementary transitional provisions		
Paragraph	Subject	Time limit and comments
9.3.1.92 9.3.2.92	Emergency Exit	N.R.M. The following requirements apply on board vessels in service: Spaces the entrances or exits of which are partly or fully immersed in damaged condition shall be provided with an emergency exit not less than 0.075 m above the damage waterline.

1.6.7.4 *Transitional provisions concerning the transport of substances hazardous to the environment or to health*

1.6.7.4.1 *Transitional provisions: vessels*

Single-hull tank vessels in service on 1 January 2009 with a dead weight on 1 January 2007 of less than 1,000 tonnes may continue to transport the substances they were authorized to carry on 31 December 2008 until 31 December 2018.

Supply vessels and oil separator vessels in service on 1 January 2009 with a dead weight on 1 January 2007 of less than 300 tonnes may continue to transport the substances they were authorized to carry on 31 December 2008 until 31 December 2038.

1.6.7.4.2 *Transitional periods applicable to substances*

By way of derogation from Part 3, Table C, the substances listed below may be transported in accordance with the requirements referred to in the following tables until the date specified.

UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of blue cones/lights	Additional requirements/Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1145	CYCLOHEXANE	3	F1	II	3+N1	N	2	2		10	97	0.78	3	yes	T3	II A	yes	PP, EX, A	1	6; +11 °C; 17
1146	CYCLOPENTANE	3	F1	II	3+N2	N	2	2		10	97	0.75	3	yes	T2	II A	yes	PP, EX, A	1	
1157	DIISOBUTYL KETONE	3	F1	III	3+N3+F	N	3	2			97	0.81	3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	
1159	DIISOPROPYL ETHER	3	F1	II	3+N2	N	2	2		10	97	0.72	3	yes	T2	II A	yes	PP, EX, A	1	
1171	ETHYLENE GLYCOL MONOETHYL ETHER	3	F1	III	3+CMR	N	3	2			97	0.93	3	yes	T3	II B	yes	PP, EX, A	0	
1172	ETHYLENE GLYCOL MONOETHYL ETHER ACETATE	3	F1	III	3+N3+CMR	N	3	2			97	0.98	3	yes	T2	II A	yes	PP, EX, A	0	
1188	ETHYLENE GLYCOL MONOMETHYL ETHER	3	F1	III	3+CMR	N	3	2			97	0.97	3	yes	T3	II B	yes	PP, EX, A	0	
1191	OCTYL ALDEHYDES (2-ETHYLOCTALDEHYDE)	3	F1	III	3+N3+F	N	3	2			97	0.82	3	yes	T3	II B ⁴⁾	yes	PP, EX, A	0	
1206	HEPTANES (n-HEPTANE)	3	F1	II	3+N1	N	2	2		10	97	0.68	3	yes	T3	II A	yes	PP, EX, A	1	
1208	HEXANES (n-HEXANE)	3	F1	II	3+N1	N	2	2		10	97	0.66	3	yes	T3	II A	yes	PP, EX, A	1	
1216	ISOCTENE	3	F1	II	3+N2	N	2	2		10	97	0.73	3	yes	T3	II B ⁴⁾	yes	PP, EX, A	1	
1224	KETONES, LIQUID, N.O.S. 110 kPa < vp50 ≤ 175 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2		50	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29
1224	KETONES, LIQUID, N.O.S. 110 kPa < vp50 ≤ 175 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2	3	10	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29

UN No. or substance identification No.	(1)	Name and description	(2)	Class	(3a)	Classification code	(3b)	Packing group	(4)	Dangers	(5)	Type of tank vessel	(6)	Cargo tank design	(7)	Cargo tank type	(8)	Cargo tank equipment	(9)	Opening pressure of the high-velocity vent valve in kPa	(10)	Maximum degree of filling in %	(11)	Relative density at 20 °C	(12)	Type of sampling device	(13)	Pump room below deck permitted	(14)	Temperature class	(15)	Explosion group	(16)	Anti-explosion protection required	(17)	Equipment required	(18)	Number of blue cones/lights	(19)	Additional requirements/Remarks	(20)
1224		KETONES, LIQUID, N.O.S. vp50 ≤ 110 kPa		3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2	2	2	2	2	2	2	2				10	97	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29									
1224		KETONES, LIQUID, N.O.S.		3	F1	III	3+(N1, N2, N3, CMR, F or S)	N	3														97	97	3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14; 27									
1262		OCTANES (n-OCTANE)		3	F1	II	3+N1	N	2	2											10	97	97	0.7	3	yes	T3	II A	yes	PP, EX, A	1										
1265		PENTANES, liquid (n-PENTANE)		3	F1	II	3+N2	N	2	2											50	97	97	0.63	3	yes	T3	II A	yes	PP, EX, A	1										
1265		PENTANES, liquid (n-PENTANE)		3	F1	II	3+N2	N	2	2											10	97	97	0.63	3	yes	T3	II A	yes	PP, EX, A	1										
1267		PETROLEUM CRUDE OIL vp50 > 175 kPa		3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	1	1													97	97	1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 29									
1267		PETROLEUM CRUDE OIL vp50 > 175 kPa		3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	2	2											50	97	97		2	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 29									
1267		PETROLEUM CRUDE OIL 110 kPa < vp50 ≤ 175 kPa		3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2											50	97	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 29									
1267		PETROLEUM CRUDE OIL 110 kPa < vp50 ≤ 150 kPa		3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2											10	97	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 29									
1267		PETROLEUM CRUDE OIL vp50 ≤ 110 kPa		3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	2	2											10	97	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 29									

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UN No. or substance identification No.	(1)	Name and description	(2)	Class	(3a)	Classification code	(3b)	Packing group	(4)	Dangers	(5)	Type of tank vessel	(6)	Cargo tank design	(7)	Cargo tank type	(8)	Cargo tank equipment	(9)	Opening pressure of the high-velocity vent valve in kPa	(10)	Maximum degree of filling in %	(11)	Relative density at 20 °C	(12)	Type of sampling device	(13)	Pump room below deck permitted	(14)	Temperature class	(15)	Explosion group	(16)	Anti-explosion protection required	(17)	Equipment required	(18)	Number of blue cones/lights	(19)	Additional requirements/Remarks	(20)
1267		PETROLEUM CRUDE OIL vp50 ≤ 110 kPa		3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2	2	2	2	2	2	2	2	2	2	2	10	97	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 29									
1267		PETROLEUM CRUDE OIL		3	F1	III	3+(N1, N2, N3, CMR, F or S)	N	3	2												97	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14									
1307		XYLENES (o-XYLENE)		3	F1	III	3+N2	N	3	2												97	0.88		3	yes	T1	II A	yes	PP, EX, A	0										
1307		XYLENES (m-XYLENE)		3	F1	III	3+N2	N	3	2												97	0.86		3	yes	T1	II A	yes	PP, EX, A	0										
1307		XYLENES (p-XYLENE)		3	F1	III	3+N2	N	3	2												97	0.86		3	yes	T1	II A	yes	PP, EX, A	0	6; +17 °C; 17									
1307		XYLENES (mixture with boiling point ≤ 0° C)		3	F1	II	3+N2	N	3	2												97			3	yes	T1	II A	yes	PP, EX, A	1										
1307		XYLENES (mixture with boiling point ≤ 0° C)		3	F1	III	3+N2	N	3	2												97			3	yes	T1	II A	yes	PP, EX, A	0										
1307		XYLENES (mixture with 0° C < boiling point < 13° C)		3	F1	I	3+N2	N	3	2												97			3	yes	T1	II A	yes	PP, EX, A	0	6; +17 °C; 17									
1719		CAUSTIC ALKALI LIQUID, N.O.S.		8	C5	II	8+(N1, N2, N3, CMR, F or S)	N	4	2												97			3	yes						no	PP, EP	0	27; 30; 34						
1719		CAUSTIC ALKALI LIQUID, N.O.S.		8	C5	III	8+(N1, N2, N3, CMR, F or S)	N	4	2													97			3	yes						no	PP, EP	0	27; 30; 34					
1760		CORROSIVE LIQUID, N.O.S.		8	C9	I	8+(N1, N2, N3, CMR, F or S)	N	2	3												10	97			3	yes						no	PP, EP	0	27; 34					
1760		CORROSIVE LIQUID, N.O.S.		8	C9	II	8+(N1, N2, N3, CMR, F or S)	N	2	3												10	97			3	yes						no	PP, EP	0	27; 34					

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UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of blue cones/lights	Additional requirements/Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1760	CORROSIVE LIQUID, N.O.S.	8	C9	III	8+(N1, N2, N3, CMR, F or S)	N	4	3			97		3	yes			no	PP, EP	0	27; 34
1760	CORROSIVE LIQUID, N.O.S. (SODIUM MERCAPTO-BENZOTHIASZOLE, 50 % AQUEOUS SOLUTION)	8	C9	II	8+N1+S	N	4	2			97	1.25	3	yes			no	PP, EP	0	34
1760	CORROSIVE LIQUID, N.O.S. (FATTY ALCOHOL, C ₁₂ -C ₁₄)	8	C9	III	8+F	N	4	2			97	0.89	3	yes			no	PP, EP	0	34
1764	DICHLOROACETIC ACID	8	C3	II	8+N1	N	3	3			97	1.56	3	yes	T1	II A	yes	PP, EP, EX, A	0	17; 34
1918	ISOPROPYLBENZENE (cumene)	3	F1	III	3+N2	N	3	2			97	0.86	3	yes	T2	II A ⁸⁾	yes	PP, EX, A	0	
1920	NONANES	3	F1	III	3+N2+F	N	3	2			97	0,70 - 0,75	3	yes	T3	II A	yes	PP, EX, A	0	
1987	ALCOHOLS, N.O.S. 110 kPa < vp50 ≤ 175 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2		50	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29
1987	ALCOHOLS, N.O.S. 110 kPa < vp50 ≤ 150 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2	3	10	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29
1987	ALCOHOLS, N.O.S. vp50 ≤ 110 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2		10	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29
1987	ALCOHOLS, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	N	3	2			97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14; 27

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UN No. or substance identification No.	(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of blue cones/lights	Additional requirements/Remarks		
1987 ALCOHOLS, N.O.S. (CYCLOHEXANOL)	3	F1	III	3+N3+H	N	3	2	2		95	0.95	3	yes	T3	II A	yes	PP, EX, A	0	7; 17		
1989 ALDEHYDES, N.O.S. 110 kPa < vp50 ≤ 175 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2		50	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29		
1989 ALDEHYDES, N.O.S. 110 kPa < vp50 ≤ 150 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2	3	10	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14; 27; 29		
1989 ALDEHYDES, N.O.S. 110 kPa < vp50	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2		10	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14; 27; 29		
1989 ALDEHYDES, N.O.S. 110 kPa < vp50 ≤ 175 kPa	3	F1	III	3+(N1, N2, N3, CMR, F or S)	N	3	2			97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14; 27		
1993 FLAMMABLE LIQUID, N.O.S. vp50 > 175 kPa	3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	1	1			97		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29		
1993 FLAMMABLE LIQUID, N.O.S. vp50 > 175 kPa	3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	2	2	1	50	97		2	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29		
1993 FLAMMABLE LIQUID, N.O.S. 110 kPa < vp50 ≤ 175 kPa	3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	2	2		50	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29		
1993 FLAMMABLE LIQUID, N.O.S. 110 kPa < vp50 ≤ 175 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2		50	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29		
1993 FLAMMABLE LIQUID, N.O.S. 110 kPa < vp50 ≤ 150 kPa	3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	2	2	3	10	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29		

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UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of blue cones/lights	Additional requirements/Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1993	FLAMMABLE LIQUID, N.O.S. 110 kPa < vp50 ≤ 150 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2	3	10	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29
1993	FLAMMABLE LIQUID, N.O.S. vp50 ≤ 110 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2		10	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29
1993	FLAMMABLE LIQUID, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	N	3	2			97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14; 27
1993	FLAMMABLE LIQUID, N.O.S. (CYCLOHEXANONE/ CYCLOHEXANOL MIXTURE)	3	F1	III	3+F	N	3	2			97	0.95	3	yes	T3	II A	yes	PP, EX, A	0	
1999	TARS, LIQUID, including road asphalt and oils, bitumen and cut backs	3	F1	III	3+S	N	4	2	2		97		3	yes	T3	II A ⁷⁾	yes	PP, EX, A	0	
2046	CYMENES	3	F1	III	3+N2+F	N	3	2			97	0.88	3	yes	T2	II A	yes	PP, EX, A	0	
2048	DICYCLOPENTADIENE	3	F1	III	3+N2+F	N	3	2	2		95	0.94	3	yes	T1	II B ⁴⁾	yes	PP, EX, A	0	7; 17
2050	DIISOBUTYLENE, ISOMERIC COMPOUNDS	3	F1	II	3+N2+F	N	2	2		10	97	0.72	3	yes	T3 ²⁾	II A ⁷⁾	yes	PP, EX, A	1	
2241	CYCLOHEPTANE	3	F1	II	3+N2	N	2	2		10	97	0.81	3	yes	T4 ³⁾	II A	yes	PP, EX, A	1	
2247	n-DECANE	3	F1	III	3+F	N	3	2			97	0.73	3	yes	T4	II A	yes	PP, EX, A	0	
2259	TRIETHYLENETETRAMINE	8	C7	II	8+N2	N	3	2			97	0.98	3	yes	T2	II B ⁴⁾	yes	PP, EP, EX, A	1	34
2264	N,N-DIMETHYLCYCLO- HEXYLAMINE	8	CF1	II	8+3+N2	N	3	2			97	0.85	3	yes	T3	II B ⁴⁾	yes	PP, EP, EX, A	1	34
2265	N,N-DIMETHYL- FORMAMIDE	3	F1	III	3+CMR	N	3	2			97	0.95	3	yes	T2	II A	yes	PP, EX, A	0	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
2286	PENTAMETHYLHEPTANE	3	F1	III	3+F	N	3	2			97	0.75	3	yes	T2	II A ⁷⁾	yes	PP, EX, A	0	
2289	ISOPHORONEDIAMINE	8	C7	III	8+N2	N	3	2			97	0.92	3	yes	T2	II A	yes	PP, EP, EX, A	0	17; 34
2303	ISOPROPENYLBENZENE	3	F1	III	3+N2+H	N	3	2			97	0.91	3	yes	T2	II B	yes	PP, EX, A	0	
2309	OCTADIENE (1,7- OCTADIENE)	3	F1	II	3+N2	N	2	2		10	97	0.75	3	yes	T3	II B ⁴⁾	yes	PP, EX, A	1	
2320	TETRAETHYLENE-PENTAMINE	8	C7	III	8+N2	N	4	2			97	1	3	yes			no	PP, EP	0	34
2324	TRISOBUTYLENE	3	F1	III	3+N1+H	N	3	2			97	0.76	3	yes	T2	II B ⁴⁾	yes	PP, EX, A	0	
2325	1,3,5-TRIMETHYLBENZENE	3	F1	III	3+N1	N	3	2			97	0.87	3	yes	T1	II A	yes	PP, EX, A	0	
2414	THIOPHENE	3	F1	II	3+N3+S	N	2	2		10	97	1.06	3	yes	T2	II A	yes	PP, EX, A	1	
2430	ALKYLPHENOLS, SOLID, N.O.S. (nonylphenol, isomeric mixture, molten)	8	C4	II	8+N1+H	N	3	3	2		95	0.95	3	yes	T2	II A ⁷⁾	yes	PP, EP, EX, A	0	7; 17; 34
2564	TRICHLOROACETIC ACID SOLUTION	8	C3	II	8+N1	N	3	3	2		95	1,62 ¹¹⁾	3	yes	T1	II A ⁷⁾	yes	PP, EP, EX, A	0	7; 17; 22; 34
2564	TRICHLOROACETIC ACID SOLUTION	8	C3	III	8+N1	N	4	3			97	1,62 ¹¹⁾	3	yes	T1	II A ⁷⁾	yes	PP, EP, EX, A	0	22; 34
2672	AMMONIA SOLUTION (relative density between 0.880 and 0.957 at 15 °C in water, with more than 10 % but not more than 35 % ammonia)	8	C5	III	8+N1	N	2	2		10	97	0,88 ¹⁰⁾ - 0,96 ¹⁰⁾	3	yes			no	PP, EP	0	34
2709	BUTYLBENZENES	3	F1	III	3+N1+H	N	3	2			97	0.87	3	yes	T2	II A	yes	PP, EX, A	0	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8	C7	I	8+(N1, N2, N3, CMR, F or S)	N	4	2			97		3	yes			no	PP, EP	0	27; 34
2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8	C7	II	8+(N1, N2, N3, CMR, F or S)	N	4	2			97		3	yes			no	PP, EP	0	27; 34
2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8	C7	III	8+(N1, N2, N3, CMR, F or S)	N	4	2			97		3	yes			no	PP, EP	0	27; 34
2815	N-AMINOETHYL-PIPERAZINE	8	C7	III	8+N2	N	4	2			97	0.98	3	yes			no	PP, EP	0	34
2850	PROPYLENE TETRAMER	3	F1	III	3+N1+F	N	4	2			97	0.76	3	yes			no	PP	0	
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S.	3	FC	III	3+8+(N1, N2, N3, CMR, F or S)	N	3	2			97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EP, EX, A	0	27; 34
3256	ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point	3	F2	III	3+8+(N1, N2, N3, CMR, F or S)	N	3	2	2		95		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	7; 27
3256	ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point (CARBON BLACK REEDSTOCK) (PYROLYSIS OIL)	3	F2	III	3+F	N	3	2	2		95		3	yes	T 1	II B	yes	PP, EX, A	0	7

(Until 31.12.2012)

UN No. or substance identification No.	(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Name and description																					
3256		ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point (PYROLYSIS OIL A)	3	F2	III	3+F	N	3	2	2		95		3	yes	T 1	II B	yes	PP, EX, A	0	7
3256		ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point (RESIDUAL OIL)	3	F2	III	3+F	N	3	2	2		95		3	yes	T 1	II B	yes	PP, EX, A	0	7
3256		ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point (MIXTURE OF CRUDE NAPHTHALINE)	3	F2	III	3+F	N	3	2	2		95		3	yes	T 1	II B	yes	PP, EX, A	0	7
3256		ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point (CREOSOTE OIL)	3	F2	III	3+N2+ CMR+5	N	3	2	2		95		3	yes	T 2	II B	yes	PP, EX, A	0	7
3264		CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8	C1	I	8+(N1, N2, N3, CMR, F or S)	N	2	3		10	97		3	yes			no	PP, EP	0	27; 34
3264		CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8	C1	II	8+(N1, N2, N3, CMR, F or S)	N	2	3		10	97		3	yes			no	PP, EP	0	27; 34
3264		CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8	C1	III	8+(N1, N2, N3, CMR, F or S)	N	4	3			97		3	yes			no	PP, EP	0	27; 34

(Until 31.12.2012)

UN No. or substance identification No.	(1)	Name and description	(2)	Class	(3a)	Classification code	(3b)	Packing group	(4)	Dangers	(5)	Type of tank vessel	(6)	Cargo tank design	(7)	Cargo tank type	(8)	Cargo tank equipment	(9)	Opening pressure of the high-velocity vent valve in kPa	(10)	Maximum degree of filling in %	(11)	Relative density at 20 °C	(12)	Type of sampling device	(13)	Pump room below deck permitted	(14)	Temperature class	(15)	Explosion group	(16)	Anti-explosion protection required	(17)	Equipment required	(18)	Number of blue cones/lights	(19)	Additional requirements/Remarks	(20)
3265		CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.		8	C3	I	8+(N1, N2, N3, CMR, F or S)	N	2	3	3			10	97	3	yes								3	yes						no	PP, EP	0	27; 34						
3265		CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.		8	C3	II	8+(N1, N2, N3, CMR, F or S)	N	2	3	3			10	97	3	yes								3	yes						no	PP, EP	0	27; 34						
3265		CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.		8	C3	III	8+(N1, N2, N3, CMR, F or S)	N	4	3	3				97	3	yes								3	yes						no	PP, EP	0	27; 34						
3266		CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.		8	C5	I	8+(N1, N2, N3, CMR, F or S)	N	4	2	2				97	3	yes								3	yes						no	PP, EP	0	27; 34						
3266		CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.		8	C5	II	8+(N1, N2, N3, CMR, F or S)	N	4	2	2				97	3	yes								3	yes						no	PP, EP	0	27; 34						
3266		CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.		8	C5	III	8+(N1, N2, N3, CMR, F or S)	N	4	2	2				97	3	yes								3	yes						no	PP, EP	0	27; 34						
3267		CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.		8	C7	I	8+(N1, N2, N3, CMR, F or S)	N	4	2	2				97	3	yes								3	yes						no	PP, EP	0	27; 34						
3267		CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.		8	C7	II	8+(N1, N2, N3, CMR, F or S)	N	4	2	2				97	3	yes								3	yes						no	PP, EP	0	27; 34						
3267		CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.		8	C7	III	8+(N1, N2, N3, CMR, F or S)	N	4	2	2				97	3	yes								3	yes						no	PP, EP	0	27; 34						

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UN No. or substance identification No.	(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
3271	ETHERS, N.O.S. vp50 ≤ 110 kPa		3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2		10	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14, 27; 29
3271	ETHERS, N.O.S. (tert-AMYL METHYL ETHER)		3	F1	II	3+N1	N	2	2		10	97	0.77	3	yes	T2	II B ⁴⁾	yes	PP, EX, A	1	
3271	ETHERS, N.O.S.		3	F1	III	3+(N1, N2, N3, CMR, F or S)	N	3	2			97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14, 27
3272	ESTERS, N.O.S. vp50 ≤ 110 kPa		3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2		10	97	0.77	3	yes	T2	II B ⁴⁾	yes	PP, EX, A	1	14, 27; 29
3272	ESTERS, N.O.S.		3	F1	III	3+(N1, N2, N3, CMR, F or S)	N	3	2			97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14, 27
9001	SUBSTANCES WITH A FLASH-POINT ABOVE 60 °C handed over for carriage or carried at a TEMPERATURE WITHIN A RANGE OF 15 K BELOW THEIR FLASH-POINT or SUBSTANCES WITH A FLASH-POINT > 60 °C, HEATED TO LESS THAN 15 K FROM THE FLASH-POINT		3	F3		3+(N1, N2, N3, CMR, F or S)	N	3	2			97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	27

(Until 31.12.2012)

UN No. or substance identification No.	(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
9003		SUBSTANCES WITH A FLASH-POINT ABOVE 60 °C BUT NOT MORE THAN 100 °C or SUBSTANCES WHERE 61 °C < FLASH- POINT ≤ 100° C, which are not affected to another class	9			9+(N3+H)	N	4	2			97		3	yes			no	PP	0	0 27
9003		SUBSTANCES WITH A FLASH-POINT ABOVE 60 °C BUT NOT MORE THAN 100 °C or SUBSTANCES WHERE 61 °C < FLASH- POINT ≤ 100° C, which are not affected to another class (ETHYLENE GLYCOL MONOBUTYL ETHER)	9			9+(N3+H)	N	4	2			97	0.9	3	yes			no	PP	0	
9003		SUBSTANCES WITH A FLASH-POINT ABOVE 60 °C BUT NOT MORE THAN 100 °C or SUBSTANCES WHERE 61 °C < FLASH- POINT ≤ 100° C, which are not affected to another class (2-ETHYL-HEXYLACRYLATE)	9			9+(N3+H)	N	4	2			97	0.89	3	yes			no	PP	0	3; 5; 16

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UN No. or substance identification No.	(1)	9005	9006
Name and description	(2)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., MOLTEN	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Class	(3a)	9	9
Classification code	(3b)		
Packing group	(4)		
Dangers	(5)	9+(N1, N2, N3, CMR, F or S)	9+(N1, N2, N3, CMR, F or S)
Type of tank vessel	(6)		
Cargo tank design	(7)		
Cargo tank type	(8)		
Cargo tank equipment	(9)		
Opening pressure of the high-velocity vent valve in kPa	(10)		
Maximum degree of filling in %	(11)		
Relative density at 20 °C	(12)		
Type of sampling device	(13)	free	free
Pump room below deck permitted	(14)		
Temperature class	(15)		
Explosion group	(16)		
Anti-explosion protection required	(17)		
Equipment required	(18)		
Number of blue cones/lights	(19)		
Additional requirements/Remarks	(20)		

(Until 31.12.2012)

2. Until 31.12.2015

UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of blue cones/lights	Additional requirements/Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1203	MOTOR SPIRIT or GASOLINE or PETROL	3	F1	II	3+N2+CMR+F	N	2	2		10	97	0,68 - 0,72 10)	3	yes	T3	II A	yes	PP, EX, A	1	14
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. vp50 > 175 kPa	3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	1	1			97		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. vp50 > 175 kPa	3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	2	2	1	50	97		2	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. 110 kPa < vp50 ≤ 175 kPa	3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	2	2		50	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. 110 kPa < vp50 ≤ 175 kPa	3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	2	2	3	10	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. 110 kPa < vp50 ≤ 175 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2		50	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29

(Until 31.12.2015)

UN No. or substance identification No.	(1)	Name and description	(2)	(3a)	Class	Classification code	(3b)	Packing group	(4)	Dangers	(5)	Type of tank vessel	(6)	Cargo tank design	(7)	Cargo tank type	(8)	Cargo tank equipment	(9)	Opening pressure of the high-velocity vent valve in kPa	(10)	Maximum degree of filling in %	(11)	Relative density at 20 °C	(12)	Type of sampling device	(13)	Pump room below deck permitted	(14)	Temperature class	(15)	Explosion group	(16)	Anti-explosion protection required	(17)	Equipment required	(18)	Number of blue cones/lights	(19)	Additional requirements/Remarks	(20)
1268		PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. 110 kPa < vp50 ≤ 150 kPa		3	F1	II		3+(N1, N2, N3, CMR, F or S)	N	2	2	2	3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29																					
1268		PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. vp50 ≤ 110 kPa		3	F1	I		3+(N1, N2, N3, CMR, F or S)	N	2	2	2	3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29																					
1268		PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. vp50 ≤ 110 kPa		3	F1	II		3+(N1, N2, N3, CMR, F or S)	N	2	2	2	3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29																					
1268		PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S.		3	F1	III		3+(N1, N2, N3, CMR, F or S)	N	3	2	2	3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14; 27																					
1268		PETROLEUM DISTILLATES; N.O.S. or PETROLEUM PRODUCTS, N.O.S. (naphtha) 110 kPa < vp50 ≤ 150 kPa		3	F1	II		3+N2+ CMR+F	N	2	2	2	3	yes	T3	II A	yes	PP, EX, A	1	14; 27; 29																					
1268		PETROLEUM DISTILLATES; N.O.S. or PETROLEUM PRODUCTS, N.O.S. (naphtha) 110 kPa < vp50 ≤ 150 kPa		3	F1	II		3+N2+ CMR+F	N	2	2	2	3	yes	T3	II A	yes	PP, EX, A	1	14; 29																					

(Until 31.12.2015)

UN No. or substance identification No.	(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Name and description																					
1268		PETROLEUM DISTILLATES, N.O.S or PETROLEUM PRODUCTS, N.O.S. (naphtha) vp50 ≤ 110 kPa	3	F1	II	3+N2+CMR+F	N	2	2		10	97	0.735	3	yes	T3	II A	yes	PP, EX, A	1	14; 29
1268		PETROLEUM DISTILLATES, N.O.S, or PETROLEUM PRODUCTS, N.O.S. (benzene heart cut) vp50 ≤ 110 kPa	3	F1	II	3+N2+CMR+F	N	2	2		10	97	0.765	3	yes	T3	II A	yes	PP, EX, A	1	14; 29
1987		ALCOHOLS, N.O.S. (CYCLOHEXANOL)	3	F1	III	3+N3+H	N	3	2	4		95	0.95	3	yes			no	PP	0	7; 17; 20; +46 °C
2430		ALKYLPHENOLS, SOLID, N.O.S. (nonylphenol, isomeric mixture, molten)	8	C4	II	8+NI+H	N	3	1	4		95	0.95	3	yes			no	PP, EP	0	7; 17; 20; +125 °C; 34
3256		ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point (Low QI Pitch)	3	F2	III	3+ (N2 or N3) +F	N	3	1	4		95	1,1-1,3	3	yes	T2	II B	yes	PP, EX, A	0	7
3257		ELEVATED TEMPERATURE LIQUID, N.O.S. at or above 100 °C and below its flash-point (including molten metals, molten salts, etc.)	9	M9	III	9+(N1, N2, N3, CMR, F or S)	N	4	1	4		95		3	yes			no	PP	0	7; 20; +115 °C; 22; 24; 25; 27

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UN No. or substance identification No.	(1)	Name and description	(2)	(3a)	Class	Classification code	(3b)	Packing group	(4)	Dangers	(5)	Type of tank vessel	(6)	Cargo tank design	(7)	Cargo tank type	(8)	Cargo tank equipment	(9)	Opening pressure of the high-velocity vent valve in kPa	(10)	Maximum degree of filling in %	(11)	Relative density at 20 °C	(12)	Type of sampling device	(13)	Pump room below deck permitted	(14)	Temperature class	(15)	Explosion group	(16)	Anti-explosion protection required	(17)	Equipment required	(18)	Number of blue cones/lights	(19)	Additional requirements/Remarks	(20)
3257		ELEVATED TEMPERATURE LIQUID, N.O.S. at or above 100 °C and below its flash-point (including molten metals, molten salts, etc.)	9	M9	III	9+(N1, N2, N3, CMR, F or S)	N	4	1	4												95		3	yes								no	PP	0	7; 20; +225 °C; 22; 24; 27					
3295		HYDROCARBONS, LIQUID, N.O.S. vp50 > 175 kPa	3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	1	1	1												97		1	yes							yes	PP, EX, A	1	14; 27; 29						
3295		HYDROCARBONS, LIQUID, N.O.S. vp50 > 175 kPa	3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	2	2	1												97		1	yes							yes	PP, EX, A	1	14; 27; 29						
3295		HYDROCARBONS, LIQUID, N.O.S. 110 kPa < vp50 < 175 kPa	3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	2	2													97		3	yes							yes	PP, EX, A	1	14; 27; 29						
3295		HYDROCARBONS, LIQUID, N.O.S. 110 kPa < vp50 < 150 kPa	3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	2	2													97		3	yes							yes	PP, EX, A	1	14; 27; 29						
3295		HYDROCARBONS, LIQUID, N.O.S. 110 kPa < vp50 < 175 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2													97		3	yes							yes	PP, EX, A	1	14; 27; 29						
3295		HYDROCARBONS, LIQUID, N.O.S. 110 kPa < vp50 < 150 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2													97		3	yes							yes	PP, EX, A	1	14; 27; 29						
3295		HYDROCARBONS, LIQUID, N.O.S. vp50 ≤ 110 kPa	3	F1	I	3+(N1, N2, N3, CMR, F or S)	N	2	2													97		3	yes							yes	PP, EX, A	1	14; 27; 29						

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UN No. or substance identification No.	(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
3295	HYDROCARBONS, LIQUID, N.O.S. vp50 ≤ 110 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	N	2	2	2		10	97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29
3295	HYDROCARBONS, LIQUID, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	N	3	2	2			97		3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14; 27
3295	HYDROCARBONS, LIQUID, N.O.S. (1-octen)	3	F1	II	3+N2+H	N	2	2	2		10	97	0.71	3	yes	T3	II B ⁴⁾	yes	PP, EX, A	1	14
3295	HYDROCARBONS, LIQUID, N.O.S. (polycyclic aromatic hydrocarbons mixture)	3	F1	III	3+CMR+F	N	3	2	2			97	1.08	3	yes	T1	II A	yes	PP, EX, A	0	14

(Until 31.12.2015)

UN No. or substance identification No.	(1)	Name and description	(2)	Class	(3a)	Classification code	(3b)	Packing group	(4)	Dangers	(5)	Type of tank vessel	(6)	Cargo tank design	(7)	Cargo tank type	(8)	Cargo tank equipment	(9)	Opening pressure of the high-velocity vent valve in kPa	(10)	Maximum degree of filling in %	(11)	Relative density at 20 °C	(12)	Type of sampling device	(13)	Pump room below deck permitted	(14)	Temperature class	(15)	Explosion group	(16)	Anti-explosion protection required	(17)	Equipment required	(18)	Number of blue cones/lights	(19)	Additional requirements/Remarks	(20)
1202		GAS OIL or DIESEL FUEL or HEATING OIL (LIGHT) (flash-point not more than 60 °C)		3	F1	III	3+(N1, N2, N3, CMR, F)	N	4	2				3	yes							97	< 0,85	3								non	PP	0							
1202		GAS OIL complying with standard EN 590: 2004 or DIESEL FUEL or HEATING OIL (LIGHT) with flash-point as specified in EN 590:2004		3	F1	III	3+N2+F	N	4	2				3	yes							97	0,82 - 0,85	3								non	PP	0							
1202		GAS OIL or DIESEL FUEL or HEATING OIL (LIGHT) (flash-point more than 60 °C but not more than 100 °C)		3	F1	III	3+(N1, N2, N3, CMR, F or S)	N	4	2				3	yes							97	< 1,1	3								non	PP	0							
1223		KEROSENE		3	F1	III	3+N2+F	N	3	2				3	yes							97	≤ 0,83	3							T3	II A	yes	PP, EX, A	0	14					
1300		TURPENTINE SUBSTITUTE		3	F1	III	3+N2+F	N	3	2				3	yes							97	0,78	3							T3	II B ⁴⁾	yes	PP, EX, A	0						
1863		FUEL, AVIATION, TURBINE ENGINE vp50 > 175 kPa		3	F1	I	3+(N1, N2, N3, CMR, F)	N	1	1				1	yes							97		1							T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 29					
1863		FUEL, AVIATION, TURBINE ENGINE vp50 > 175 kPa		3	F1	I	3+(N1, N2, N3, CMR, F)	N	2	1				2	yes							97		2							T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 29					
1863		FUEL, AVIATION, TURBINE ENGINE 110 kPa < vp50 ≤ 175 kPa		3	F1	II	3+(N1, N2, N3, CMR, F)	N	2	2				2	yes							97		3							T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 29					
1863		FUEL, AVIATION, TURBINE ENGINE 110 kPa < vp50 ≤ 150 kPa		3	F1	II	3+(N1, N2, N3, CMR, F)	N	2	3				3	yes							97		3							T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 29					

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Additional requirements/Remarks	(20)		
Number of blue cones/lights	(19)	1	0
Equipment required	(18)	PP, EX, A	PP, EX, A
Anti-explosion protection required	(17)	yes	yes
Explosion group	(16)	II B ⁴⁾	II B ⁴⁾
Temperature class	(15)	T4 ³⁾	T4 ³⁾
Pump room below deck permitted	(14)	yes	yes
Type of sampling device	(13)	3	3
Relative density at 20 °C	(12)		
Maximum degree of filling in %	(11)	97	97
Opening pressure of the high-velocity vent valve in kPa	(10)	10	
Cargo tank equipment	(9)		
Cargo tank type	(8)	2	2
Cargo tank design	(7)	2	3
Type of tank vessel	(6)	N	N
Dangers	(5)	3+(N1, N2, N3, CMR, F)	3+(N1, N2, N3, CMR, F)
Packing group	(4)	II	III
Classification code	(3b)	F1	F1
Class	(3a)	3	3
Name and description	(2)	FUEL, AVIATION, TURBINE ENGINE vp50 ≤ 110 kPa	FUEL, AVIATION, TURBINE ENGINE
UN No. or substance identification No.	(1)	1863	1863

(Until 31.12.2018)

CHAPTER 1.7

GENERAL PROVISIONS CONCERNING CLASS 7

1.7.1 Scope and application

NOTE 1: In the event of accidents or incidents during the carriage of radioactive material, emergency provisions, as established by relevant national and/or international organizations, shall be observed to protect persons, property and the environment. Appropriate guidelines for such provisions are contained in "Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material", Safety Standard Series No. TS-G-1.2 (ST-3), IAEA, Vienna (2002).

NOTE 2: Emergency procedures shall take into account the formation of other dangerous substances that may result from the reaction between the contents of a consignment and the environment in the event of an accident.

1.7.1.1 ADN establishes standards of safety which provide an acceptable level of control of the radiation, criticality and thermal hazards to persons, property and the environment that are associated with the carriage of radioactive material. These standards are based on the IAEA Regulations for the Safe Transport of Radioactive Material, 2005 edition, Safety Standards Series No. TS-R-1, IAEA, Vienna (2005). Explanatory material on the 1996 edition of the TS-R-1 can be found in the "Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material", Safety Standard Series No. TS-G-1.1 (ST-2), IAEA, Vienna (2002).

1.7.1.2 The objective of ADN is to protect persons, property and the environment from the effects of radiation during the carriage of radioactive material. This protection is achieved by requiring:

- (a) Containment of the radioactive contents;
- (b) Control of external radiation levels;
- (c) Prevention of criticality; and
- (d) Prevention of damage caused by heat.

These requirements are satisfied firstly by applying a graded approach to contents limits for packages and vehicles and to performance standards applied to package designs depending upon the hazard of the radioactive contents. Secondly, they are satisfied by imposing requirements on the design and operation of packages and on the maintenance of packagings, including a consideration of the nature of the radioactive contents. Finally, they are satisfied by requiring administrative controls including, where appropriate, approval by competent authorities.

1.7.1.3 ADN applies to the carriage of radioactive material by inland waterways including carriage which is incidental to the use of the radioactive material. Carriage comprises all operations and conditions associated with and involved in the movement of radioactive material; these include the design, manufacture, maintenance and repair of packaging, and the preparation, consigning, loading, carriage including in-transit storage, unloading and receipt at the final destination of loads of radioactive material and packages. A graded approach is applied to the performance standards in ADN that is characterized by three general severity levels:

- (a) Routine conditions of carriage (incident free);

- (b) Normal conditions of carriage (minor mishaps);
- (c) Accident conditions of carriage.

1.7.1.4 The provisions laid down in ADN do not apply to the carriage of:

- (a) Radioactive material that is an integral part of the means of transport;
- (b) Radioactive material moved within an establishment which is subject to appropriate safety regulations in force in the establishment and where the movement does not involve public roads or railways;
- (c) Radioactive material implanted or incorporated into a person or live animal for diagnosis or treatment;
- (d) Radioactive material in consumer products which have received regulatory approval, following their sale to the end user;
- (e) Natural material and ores containing naturally occurring radionuclides which are either in their natural state, or have only been processed for purposes other than for extraction of the radionuclides, and which are not intended to be processed for use of these radionuclides provided the activity concentration of the material does not exceed 10 times the values specified in 2.2.7.2.2.1 (b), or calculated in accordance with 2.2.7.2.2.2 to 2.2.7.2.2.6;
- (f) Non-radioactive solid objects with radioactive substances present on any surfaces in quantities not in excess of the limit set out in the definition for “contamination” in 2.2.7.1.2.

1.7.1.5 *Specific provisions for the carriage of excepted packages*

Excepted packages as specified in 2.2.7.2.4.1 shall be subject only to the following provisions of Parts 5 to 7:

- (a) The applicable requirements in 5.1.2, 5.1.3.2, 5.1.4, 5.2.1.2, 5.2.1.7.1 to 5.2.1.7.3, 5.2.1.9, 5.4.1.1.1 (a), (g) and (h) and 7.1.4.14.7.5.2;
- (b) The requirements for excepted packages specified in 6.4.4 of ADR; and
- (c) If the excepted package contains fissile material, one of the fissile exceptions provided by 2.2.7.2.3.5 shall apply and the requirement of 6.4.7.2 of ADR shall be met.

Excepted packages are subject to the relevant provisions of all other parts of ADN.

1.7.2 **Radiation protection programme**

1.7.2.1 The carriage of radioactive material shall be subject to a Radiation protection programme which shall consist of systematic arrangements aimed at providing adequate consideration of radiation protection measures.

1.7.2.2 Doses to persons shall be below the relevant dose limits. Protection and safety shall be optimized in order that the magnitude of individual doses, the number of persons exposed, and the likelihood of incurring exposure shall be kept as low as reasonably achievable, economic and social factors being taken into account within the restriction that the doses to

individuals be subject to dose constraints. A structured and systematic approach shall be adopted and shall include consideration of the interfaces between carriage and other activities.

1.7.2.3 The nature and extent of the measures to be employed in the programme shall be related to the magnitude and likelihood of radiation exposures. The programme shall incorporate the requirements in 1.7.2.2, 1.7.2.4 and 1.7.2.5. Programme documents shall be available, on request, for inspection by the relevant competent authority.

1.7.2.4 For occupational exposures arising from transport activities, where it is assessed that the effective dose:

- (a) is likely to be between 1 mSv and 6 mSv in a year, a dose assessment programme via work place monitoring or individual monitoring shall be conducted;
- (b) is likely to exceed 6 mSv in a year, individual monitoring shall be conducted.

When individual monitoring or work place monitoring is conducted, appropriate records shall be kept.

NOTE: For occupational exposures arising from transport activities, where it is assessed that the effective dose is most unlikely to exceed 1mSv in a year, no special work patterns, detailed monitoring, dose assessment programmes or individual record keeping need be required.

1.7.2.5 Workers (see 7.1.4.14.7, NOTE 3) shall receive appropriate training concerning radiation protection including the precautions to be observed in order to restrict their occupational exposure and the exposure of other persons who might be affected by their actions.

1.7.3 Quality assurance

Quality assurance programmes based on international, national or other standards acceptable to the competent authority shall be established and implemented for the design, manufacture, testing, documentation, use, maintenance and inspection of all special form radioactive material, low dispersible radioactive material and packages and for carriage and in-transit storage operations to ensure compliance with the relevant provisions of ADN. Certification that the design specification has been fully implemented shall be available to the competent authority. The manufacturer, consignor or user shall be prepared to provide facilities for competent authority inspection during manufacture and use and to demonstrate to any cognizant competent authority that:

- (a) the manufacturing methods and materials used are in accordance with the approved design specifications; and
- (b) all packagings are periodically inspected and, as necessary, repaired and maintained in good condition so that they continue to comply with all relevant requirements and specifications, even after repeated use.

Where competent authority approval is required, such approval shall take into account and be contingent upon the adequacy of the quality assurance programme.

1.7.4 Special arrangement

1.7.4.1 Special arrangement shall mean those provisions, approved by the competent authority, under which consignments which do not satisfy all the requirements of ADN applicable to radioactive material may be transported.

NOTE: Special arrangement is not considered to be a temporary derogation in accordance with 1.5.1.

1.7.4.2 Consignments for which conformity with any provision applicable to Class 7 is impracticable shall not be transported except under special arrangement. Provided the competent authority is satisfied that conformity with the Class 7 provisions of ADN is impracticable and that the requisite standards of safety established by ADN have been demonstrated through alternative means the competent authority may approve special arrangement transport operations for single or a planned series of multiple consignments. The overall level of safety in carriage shall be at least equivalent to that which would be provided if all the applicable requirements had been met. For international consignments of this type, multilateral approval shall be required.

1.7.5 Radioactive material possessing other dangerous properties

In addition to the radioactive and fissile properties, any subsidiary risk of the contents of the package, such as explosiveness, flammability, pyrophoricity, chemical toxicity and corrosiveness, shall also be taken into account in the documentation, packing, labelling, marking, placarding, stowage, segregation and carriage, in order to be in compliance with all relevant provisions for dangerous goods of ADN.

1.7.6 Non-compliance

1.7.6.1 In the event of a non-compliance with any limit in ADN applicable to radiation level or contamination,

- (a) The consignor shall be informed of the non-compliance
 - (i) by the carrier if the non-compliance is identified during carriage; or
 - (ii) by the consignee if the non-compliance is identified at receipt;
- (b) The carrier, consignor or consignee, as appropriate shall:
 - (i) take immediate steps to mitigate the consequences of the non-compliance;
 - (ii) investigate the non-compliance and its causes, circumstances and consequences;
 - (iii) take appropriate action to remedy the causes and circumstances that led to the non-compliance and to prevent a recurrence of similar circumstances that led to the non-compliance; and
 - (iv) communicate to the competent authority(ies) on the causes of the non-compliance and on corrective or preventive actions taken or to be taken; and
- (c) The communication of the non-compliance to the consignor and competent authority(ies), respectively, shall be made as soon as practicable and it shall be immediate whenever an emergency exposure situation has developed or is developing.

CHAPTER 1.8**CHECKS AND OTHER SUPPORT MEASURES TO ENSURE COMPLIANCE
WITH SAFETY REQUIREMENTS****1.8.1 Monitoring compliance with requirements****1.8.1.1 General**

1.8.1.1.1 In accordance with Article 4, paragraph 3 of ADN, Contracting Parties shall ensure that a representative proportion of consignments of dangerous goods carried by inland waterways is subject to monitoring in accordance with the provisions of this Chapter, and including the requirements of 1.10.1.5.

1.8.1.1.2 Participants in the carriage of dangerous goods (see Chapter 1.4) shall, without delay, in the context of their respective obligations, provide the competent authorities and their agents with the necessary information for carrying out the checks.

1.8.1.2 Monitoring procedure

1.8.1.2.1 In order to carry out the checks provided for in Article 4, paragraph 3 of ADN, the Contracting Parties shall use the checklist to be developed by the Administrative Committee. A copy of this checklist or a certificate showing the result of the check drawn up by the competent authority which carried it out shall be given to the master of the vessel and presented on request in order to simplify or avoid, where possible, subsequent checks. This paragraph shall not prejudice Contracting Parties' right to carry out specific measures for detailed checks.

1.8.1.2.2 The checks shall be random and shall as far as possible cover an extensive portion of the inland waterway network.

1.8.1.2.3 When exercising the right to monitor, the authorities shall make all possible efforts to avoid unduly detaining or delaying a vessel.

1.8.1.3 Infringements of the requirements

Without prejudice to other penalties which may be imposed, vessels in respect of which one or more infringements of the rules on the transport of dangerous goods by inland waterways are established may be detained at a place designated for this purpose by the authorities carrying out the check and required to be brought into conformity before continuing their journey or may be subject to other appropriate measures, depending on the circumstances or the requirements of safety.

1.8.1.4 Checks in companies and at places of loading and unloading

1.8.1.4.1 Checks may be carried out at the premises of undertakings, as a preventive measure or where infringements which jeopardize safety in the transport of dangerous goods have been recorded during the voyage.

1.8.1.4.2 The purpose of such checks shall be to ensure that safety conditions for the transport of dangerous goods by inland waterways comply with the relevant laws.

1.8.1.4.3 *Sampling*

Where appropriate and provided that this does not constitute a safety hazard, samples of the goods transported may be taken for examination by laboratories recognized by the competent authority.

1.8.1.4.4 *Cooperation of the competent authorities*

1.8.1.4.4.1 Contracting Parties shall assist one another in order to give proper effect to these requirements.

1.8.1.4.4.2 Serious or repeated infringements jeopardizing the safety of the transport of dangerous goods committed by a foreign vessel or undertaking shall be reported to the competent authority in the Contracting Party where the certificate of approval of the vessel was issued or where the undertaking is established.

1.8.1.4.4.3 The competent authority of the Contracting Party where serious or repeated infringements have been recorded may ask the competent authority of the Contracting Party where the certificate of approval of the vessel was issued or where the undertaking is established for appropriate measures to be taken with regard to the offender or offenders.

1.8.1.4.4.4 The latter competent authority shall notify the competent authorities of the Contracting Party where the infringements were recorded of any measures taken with regard to the offender or offenders.

1.8.2 **Administrative assistance during the checking of a foreign vessel**

If the findings of a check on a foreign vessel give grounds for believing that serious or repeated infringements have been committed which cannot be detected in the course of that check in the absence of the necessary data, the competent authorities of the Contracting Parties concerned shall assist one another in order to clarify the situation.

1.8.3 **Safety adviser**

1.8.3.1 Each undertaking, the activities of which include the carriage, or the related packing, loading, filling or unloading, of dangerous goods by inland waterways shall appoint one or more safety advisers, hereinafter referred to as “advisers”, for the carriage of dangerous goods, responsible for helping to prevent the risks inherent in such activities with regard to persons, property and the environment.

1.8.3.2 The competent authorities of the Contracting Parties may provide that these requirements shall not apply to undertakings:

- (a) the activities of which concern:
 - (i) The carriage of dangerous goods fully or partially exempted according to the provisions of 1.7.1.4 or of chapters 3.3, 3.4 or 3.5;
 - (ii) Quantities per transport unit, wagon or container smaller than those referred to in 1.1.3.6 of ADR or RID;
 - (iii) When (ii) above is not relevant, quantities per vessel smaller than those referred to in 1.1.3.6 of these Regulations.

- (b) the main or secondary activities of which are not the carriage or the related loading or unloading of dangerous goods but which occasionally engage in the national carriage or the related loading or unloading of dangerous goods posing little danger or risk of pollution.

1.8.3.3

The main task of the adviser shall be, under the responsibility of the head of the undertaking, to seek by all appropriate means and by all appropriate action, within the limits of the relevant activities of that undertaking, to facilitate the conduct of those activities in accordance with the requirements applicable and in the safest possible way.

With regard to the undertaking's activities, the adviser has the following duties in particular:

- monitoring compliance with the requirements governing the carriage of dangerous goods;
- advising his undertaking on the carriage of dangerous goods;
- preparing an annual report to the management of his undertaking or a local public authority, as appropriate, on the undertaking's activities in the carriage of dangerous goods. Such annual reports shall be preserved for five years and made available to the national authorities at their request.

The adviser's duties also include monitoring the following practices and procedures relating to the relevant activities of the undertaking:

- the procedures for compliance with the requirements governing the identification of dangerous goods being transported;
- the undertaking's practice in taking account, when purchasing means of transport, of any special requirements in connection with the dangerous goods being transported;
- the procedures for checking the equipment used in connection with the carriage, loading or unloading of dangerous goods;
- the proper training of the undertaking's employees and the maintenance of records of such training;
- the implementation of proper emergency procedures in the event of any accident or incident that may affect safety during the carriage, loading or unloading of dangerous goods;
- investigating and, where appropriate, preparing reports on serious accidents, incidents or serious infringements recorded during the carriage, loading or unloading of dangerous goods;
- the implementation of appropriate measures to avoid the recurrence of accidents, incidents or serious infringements;
- the account taken of the legal prescriptions and special requirements associated with the carriage of dangerous goods in the choice and use of sub-contractors or third parties;
- verification that employees involved in the carriage, loading or unloading of dangerous goods have detailed operational procedures and instructions,

- the introduction of measures to increase awareness of the risks inherent in the carriage, loading and unloading of dangerous goods;
 - the implementation of verification procedures to ensure the presence on board, means of transport of the documents and safety equipment which must accompany transport and the compliance of such documents and equipment with the regulations;
 - the implementation of verification procedures to ensure compliance with the requirements governing loading and unloading;
 - the existence of the security plan indicated in 1.10.3.2.
- 1.8.3.4 The safety adviser may also be the head of the undertaking, a person with other duties in the undertaking, or a person not directly employed by that undertaking, provided that that person is capable of performing the duties of adviser.
- 1.8.3.5 Each undertaking concerned shall, on request, inform the competent authority or the body designated for that purpose by each Contracting Party of the identity of its adviser.
- 1.8.3.6 Whenever an accident affects persons, property or the environment or results in damage to property or the environment during carriage, loading or unloading carried out by the undertaking concerned, the safety adviser shall, after collecting all the relevant information, prepare an accident report to the management of the undertaking or to a local public authority, as appropriate. That report shall not replace any report by the management of the undertaking which might be required under any other international or national legislation.
- 1.8.3.7 A safety adviser shall hold a vocational training certificate, valid for transport by inland waterways. That certificate shall be issued by the competent authority or the body designated for that purpose by each Contracting Party.
- 1.8.3.8 To obtain a certificate, a candidate shall undergo training and pass an examination approved by the competent authority of the Contracting Party.
- 1.8.3.9 The main aims of the training shall be to provide candidates with sufficient knowledge of the risks inherent in the carriage of dangerous goods, of the laws, regulations and administrative provisions applicable to the modes of transport concerned and of the duties listed in 1.8.3.3.
- 1.8.3.10 The examination shall be organized by the competent authority or by an examining body designated by the competent authority. The examining body shall not be a training provider.
- The examining body shall be designated in writing. This approval may be of limited duration and shall be based on the following criteria:
- competence of the examining body;
 - specifications of the form of the examinations the examining body is proposing;
 - measures intended to ensure that examinations are impartial;
 - independence of the body from all natural or legal persons employing safety advisers.
- 1.8.3.11 The aim of the examination is to ascertain whether candidates possess the necessary level of knowledge to carry out the duties incumbent upon a safety adviser as listed in 1.8.3.3, for the purpose of obtaining the certificate prescribed in subsection 1.8.3.7, and it shall cover at least the following subjects:

- (a) Knowledge of the types of consequences which may be caused by an accident involving dangerous goods and knowledge of the main causes of accidents;
- (b) Requirements under national law, international conventions and agreements, with regard to the following in particular:
 - classification of dangerous goods (procedure for classifying solutions and mixtures, structure of the list of substances, classes of dangerous goods and principles for their classification, nature of dangerous goods transported, physical, chemical and toxicological properties of dangerous goods);
 - general packing provisions, provisions for tanks and tank-containers (types, code, marking, construction, initial and periodic inspection and testing);
 - marking and labelling, placarding and orange plates marking (marking and labelling of packages, placing and removal of placards and orange plates);
 - particulars in transport documents (information required);
 - method of consignment and restrictions on dispatch (full load, carriage in bulk, carriage in intermediate bulk containers, carriage in containers, carriage in fixed or demountable tanks);
 - transport of passengers;
 - prohibitions and precautions relating to mixed loading;
 - segregation of goods;
 - limitation of the quantities carried and quantities exempted;
 - handling and stowage (loading and unloading - filling ratios -, stowage and segregation);
 - cleaning and/or degassing before loading and after unloading;
 - crews, vocational training;
 - vehicle documents (transport documents, instructions in writing, vessel approval certificate, ADN dangerous goods training certificate, copies of any derogations, other documents);
 - instructions in writing (implementation of the instructions and crew protection equipment);
 - supervision requirements (berthing);
 - traffic regulations and restrictions;
 - operational discharges or accidental leaks of pollutants;
 - requirements relating to equipment for transport (vessel).

1.8.3.12 *Examinations*

1.8.3.12.1 The examination shall consist of a written test which may be supplemented by an oral examination.

1.8.3.12.2 The use in the written test of documentation other than international or national regulations is not permitted.

1.8.3.12.3 Electronic media may be used only if provided by the examining body. There shall be no means of a candidate introducing further data to the electronic media provided; the candidate may only answer to the questions posed.

1.8.3.12.4 The written test shall consist of two parts:

(a) Candidates shall receive a questionnaire. It shall include at least 20 open questions covering at least the subjects mentioned in the list in 1.8.3.11. However, multiple choice questions may be used. In this case, two multiple choice questions count as one open question. Amongst these subjects particular attention shall be paid to the following subjects:

- general preventive and safety measures;
- classification of dangerous goods;
- general packing provisions, including tanks, tank-containers, tank-vehicles, etc.;
- danger markings and labels;
- information in transport document;
- handling and stowage;
- crew, vocational training;
- vehicle documents and transport certificates;
- instructions in writing;
- requirements concerning equipment for transport by vessel;

(b) Candidates shall undertake a case study in keeping with the duties of the adviser referred to in 1.8.3.3, in order to demonstrate that they have the necessary qualifications to fulfil the task of adviser.

1.8.3.13 The Contracting Parties may decide that candidates who intend working for undertakings specializing in the carriage of certain types of dangerous goods need only be questioned on the substances relating to their activities. These types of goods are:

- Class 1;
- Class 2;
- Class 7;
- Classes 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 6.2, 8 and 9;

- UN Nos. 1202, 1203, 1223, 3475, and aviation fuel classified under UN Nos. 1268 or 1863.

The certificate prescribed in 1.8.3.7 shall clearly indicate that it is only valid for one type of the dangerous goods referred to in this subsection and on which the adviser has been questioned under the conditions defined in 1.8.3.12.

Certificates of training as safety advisers issued before 1 January 2009 for UN Nos. 1202, 1203 and 1223 are also valid for UN No. 3475 and aviation fuel classified under UN Nos. 1268 or 1863.

- 1.8.3.14 The competent authority or the examining body shall keep a running list of the questions that have been included in the examination.
- 1.8.3.15 The certificate prescribed in 1.8.3.7 shall take the form laid down in 1.8.3.18 and shall be recognized by all Contracting Parties.

1.8.3.16 *Validity and renewal of certificates*

- 1.8.3.16.1 The certificate shall be valid for five years. The period of the validity of a certificate shall be extended from the date of its expiry for five years at a time where, during the year before its expiry, its holder has passed an examination. The examination shall be approved by the competent authority.
- 1.8.3.16.2 The aim of the examination is to ascertain that the holder has the necessary knowledge to carry out the duties set out in 1.8.3.3. The knowledge required is set out in 1.8.3.11 (b) and shall include the amendments to the regulations introduced since the award of the last certificate. The examination shall be held and supervised on the same basis as in 1.8.3.10 and 1.8.3.12 to 1.8.3.14. However, holders need not undertake the case study specified in 1.8.3.12.4 (b).
- 1.8.3.17 The requirements set out in 1.8.3.1 to 1.8.3.16 shall be considered to have been fulfilled if the relevant conditions of Council Directive 96/35/EC of 3 June 1996 on the appointment and vocational qualification of safety advisers for the transport of dangerous goods by road, rail and inland waterway¹ and of Directive 2000/18/EC of the European Parliament and of the Council of 17 April 2000 on minimum examination requirements for safety advisers for the transport of dangerous goods by road, rail or inland waterway² are applied.

¹ *Official Journal of the European Communities, No. L145 of 19 June 1996, page 10.*

² *Official Journal of the European Communities, No. L118 of 19 May 2000, page 41.*

1.8.3.18 *Form of certificate*

Certificate of training as safety adviser for the transport of dangerous goods

Certificate No:

Distinguishing sign of the State issuing the certificate:

Surname:

Forename(s):

Date and place of birth:

Nationality:

Signature of holder:

Valid until for undertakings which transport dangerous goods and for undertakings which carry out related loading or unloading:

by road by rail by inland waterway

Issued by:

Date:

Signature:

Extended until:

By:

Date:

Signature:

1.8.4 List of competent authorities and bodies designated by them

The Contracting Parties shall communicate to the secretariat of the United Nations Economic Commission for Europe the addresses of the authorities and bodies designated by them which are competent in accordance with national law to implement ADN, referring in each case to the relevant requirement of ADN and giving the addresses to which the relevant applications should be made.

The secretariat of the United Nations Economic Commission for Europe shall establish a list on the basis of the information received and shall keep it up-to-date. It shall communicate this list and the amendments thereto to the Contracting Parties.

1.8.5 Notifications of occurrences involving dangerous goods

1.8.5.1 If a serious accident or incident takes place during loading, filling, carriage or unloading of dangerous goods on the territory of a Contracting Party, the loader, filler, carrier or consignee, respectively, shall ascertain that a report is made to the competent authority of the Contracting Party concerned at the latest six months after the occurrence.

1.8.5.2 The Contracting Party shall in turn, if necessary, make a report to the secretariat of the United Nations Economic Commission for Europe with a view to informing the other Contracting Parties.

1.8.5.3 *An occurrence subject to report* in accordance with 1.8.5.1 has occurred if dangerous goods were released or if there was an imminent risk of loss of product, if personal injury, material or environmental damage occurred, or if the authorities were involved and one or more of the following criteria has/have been met:

Personal injury means an occurrence in which death or injury directly relating to the dangerous goods carried has occurred, and where the injury

- (a) requires intensive medical treatment,
- (b) requires a stay in hospital of at least one day, or
- (c) results in the inability to work for at least three consecutive days.

Loss of product means the release of dangerous goods of:

- (a) Classes 1 or 2 or packing group I or other substances not assigned to a packing group in quantities of 50 kg or 50 litres or more;
- (b) Packing group II in quantities of 333 kg or 333 litres or more; or
- (c) Packing group III in quantities of 1,000 kg or 1,000 litres or more.

The loss of product criterion also applies if there was an imminent risk of loss of product in the above-mentioned quantities. As a rule, this has to be assumed if, owing to structural damage, the means of containment is no longer suitable for further carriage or if, for any other reason, a sufficient level of safety is no longer ensured (e.g. owing to distortion of tanks or containers, overturning of a tank or fire in the immediate vicinity).

If dangerous goods of Class 6.2 are involved, the obligation to report applies without quantity limitation.

In occurrences involving Class 7 material, the criteria for loss of product are:

- (a) Any release of radioactive material from the packages;
- (b) Exposure leading to a breach of the limits set out in the regulations for protection of workers and members of the public against ionizing radiation (Schedule II of IAEA Safety Series No. 115 – "International Basic Safety Standards for Protection Against Ionizing Radiation and for Safety of Radiation Sources"); or
- (c) Where there is reason to believe that there has been a significant degradation in any package safety function (containment, shielding, thermal protection or criticality) that may have rendered the package unsuitable for continued carriage without additional safety measures.

NOTE: See the provisions of 7.1.4.14.7.7 for undeliverable consignments.

Material damage or environmental damage means the release of dangerous goods, irrespective of the quantity, where the estimated amount of damage exceeds 50,000 Euros. Damage to any directly involved means of carriage containing dangerous goods and to the modal infrastructure shall not be taken into account for this purpose.

Involvement of authorities means the direct involvement of the authorities or emergency services during the occurrence involving dangerous goods and the evacuation of persons or closure of public traffic routes (roads/railways/inland waterways) for at least three hours owing to the danger posed by the dangerous goods.

If necessary, the competent authority may request further relevant information.

1.8.5.4

Model report on occurrences during the carriage of dangerous goods

Report on occurrences during the carriage of dangerous goods in accordance with ADN, section 1.8.5

Report No.:

Carrier/Filler/Consignee/Loader:

Official number of vessel:

Dry cargo vessel (single-hull, double-hull):

Tank vessel (type):

Address:

Contact name: Telephone:

Fax/e-mail:

(The competent authority shall remove this cover sheet before forwarding the report)

1. Mode						
Inland waterway				Official number of vessel/name of vessel (optional)		
2. Date and location of occurrence						
Year: Month: Day: Time:						
<input type="checkbox"/> Port <input type="checkbox"/> Loading/unloading/transshipment facility Location/Country: or <input type="checkbox"/> Free sector Name of sector: Kilometre point: or <input type="checkbox"/> Structure such as bridge or guide wall				Comments concerning description of location:		
3. Conditions of inland waterway						
Water level (reference gauge):						
Estimated speed through water:						
<input type="checkbox"/> High water <input type="checkbox"/> Low water						
4. Particular weather conditions						
<input type="checkbox"/> Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Thunderstorm <input type="checkbox"/> Storm Temperature:°C						
5. Description of occurrence						
<input type="checkbox"/> Collision with bank, structure or berthing installation <input type="checkbox"/> Collision with another cargo vessel (collision/impact) <input type="checkbox"/> Collision with a passenger vessel (collision/impact) <input type="checkbox"/> Contact with the waterway bed, whether or not vessel has run aground <input type="checkbox"/> Fire <input type="checkbox"/> Explosion <input type="checkbox"/> Leak/Location and extent of damage (with additional description) <input type="checkbox"/> Shipwreck <input type="checkbox"/> Capsizing <input type="checkbox"/> Technical fault (optional) <input type="checkbox"/> Human error (optional) Additional description of occurrence:						
6. Dangerous goods involved						
UN Number ⁽¹⁾ or Identification number	Class	Packing group if known	Estimated quantity of loss of products (kg or l) ⁽²⁾	Means of containment in accordance with ADN, 1.2.1 ⁽³⁾	Means of containment material	Type of failure of means of containment ⁽⁴⁾
⁽¹⁾ For dangerous goods assigned to collective entries to which special provision 274 applies, also the technical name shall be indicated.				⁽²⁾ For class 7, indicate values according to the criteria in 1.8.5.3.		
⁽³⁾ Indicate the appropriate number: 1 Packaging 2 IBC 3 Large packaging 4 Small container 5 Wagon 6 Vehicle 7 Tank-wagon 8 Tank-vehicle 9 Battery-wagon				⁽⁴⁾ Indicate the appropriate number: 1 Loss 2 Fire 3 Explosion 4 Structural failure		

CHAPTER 1.9**TRANSPORT RESTRICTIONS BY THE COMPETENT AUTHORITIES**

- 1.9.1 In accordance with Article 6, paragraph 1 of ADN, the entry of dangerous goods into the territory of Contracting Parties may be subject to regulations or prohibitions imposed for reasons other than safety during carriage. Such regulations or prohibitions shall be published in an appropriate form.
- 1.9.2 Subject to the provisions of 1.9.3, a Contracting Party may apply to vessels engaged in the international carriage of dangerous goods by inland waterways on its territory certain additional provisions not included in ADN, provided that those provisions do not conflict with Article 4, paragraph 2 of ADN, and are contained in its domestic legislation applying equally to vessels engaged in the domestic carriage of dangerous goods by inland waterways on the territory of that Contracting Party.
- 1.9.3 Additional provisions falling within the scope of 1.9.2 are as follows:
- (a) Additional safety requirements or restrictions concerning vessels using certain structures such as bridges or tunnels, or vessels entering or leaving ports or other transport terminals;
 - (b) Requirements for vessels to follow prescribed routes to avoid commercial or residential areas, environmentally sensitive areas, industrial zones containing hazardous installations or inland waterways presenting severe physical hazards;
 - (c) Emergency requirements regarding routing or parking of vessels carrying dangerous goods resulting from extreme weather conditions, earthquake, accident, industrial action, civil disorder or military hostilities;
 - (d) Restrictions on movement of vessels carrying dangerous goods on certain days of the week or year.
- 1.9.4 The competent authority of the Contracting Party applying on its territory any additional provisions within the scope of 1.9.3 (a) and (d) above shall notify the secretariat of the United Nations Economic Commission for Europe of the additional provisions, which secretariat shall bring them to the attention of the Contracting Parties.

CHAPTER 1.10**SECURITY PROVISIONS**

NOTE: For the purposes of this Chapter, "security" means measures or precautions to be taken to minimise theft or misuse of dangerous goods that may endanger persons, property or the environment.

1.10.1 General provisions

- 1.10.1.1 All persons engaged in the carriage of dangerous goods shall consider the security requirements set out in this Chapter commensurate with their responsibilities.
- 1.10.1.2 Dangerous goods shall only be offered for carriage to carriers that have been appropriately identified.
- 1.10.1.3 Holding areas in trans-shipment zones for dangerous goods shall be secured, well lit and, where possible and appropriate, not accessible to the general public.
- 1.10.1.4 For each crew member of a vessel carrying dangerous goods, means of identification, which includes a photograph, shall be on board during carriage.
- 1.10.1.5 Safety checks in accordance with 1.8.1 shall also concern the implementation of security measures.
- 1.10.1.6 The competent authority shall maintain up-to-date registers of all valid certificates for experts stipulated in 8.2.1 issued by it or by any recognized organization.

1.10.2 Security training

- 1.10.2.1 The training and the refresher training specified in Chapter 1.3 shall also include elements of security awareness. The security refresher training need not be linked to regulatory changes only.
- 1.10.2.2 Security awareness training shall address the nature of security risks, recognising security risks, methods to address and reduce such risks and actions to be taken in the event of a security breach. It shall include awareness of security plans (if appropriate) commensurate with the responsibilities and duties of individuals and their part in implementing security plans.

1.10.3 Provisions for high consequence dangerous goods

NOTE: "High consequence dangerous goods" are those which have the potential for misuse in a terrorist incident and which may, as a result, produce serious consequences such as mass casualties or mass destruction.

- 1.10.3.1 The list of high consequence dangerous goods is provided in Table 1.10.5.

1.10.3.2 Security plans

- 1.10.3.2.1 Carriers, consignors and other participants specified in 1.4.2 and 1.4.3 engaged in the carriage of high consequence dangerous goods (see Table 1.10.5) shall adopt, implement and comply with a security plan that addresses at least the elements specified in 1.10.3.2.2.
- 1.10.3.2.2 The security plan shall comprise at least the following elements:

- (a) specific allocation of responsibilities for security to competent and qualified persons with appropriate authority to carry out their responsibilities;
- (b) records of dangerous goods or types of dangerous goods concerned;
- (c) review of current operations and assessment of security risks, including any stops necessary to the transport operation, the keeping of dangerous goods in the vessel, tank or container before, during and after the journey and the intermediate temporary storage of dangerous goods during the course of intermodal transfer or transshipment between units;
- (d) clear statement of measures that are to be taken to reduce security risks, commensurate with the responsibilities and duties of the participant, including:
 - training;
 - security policies (e.g. response to higher threat conditions, new employee/employment verification, etc.);
 - operating practices (e.g. choice/use of routes where known, access to dangerous goods in intermediate temporary storage (as defined in (c)), proximity to vulnerable infrastructure etc.);
 - equipment and resources that are to be used to reduce risks;
- (e) effective and up to date procedures for reporting and dealing with security threats, breaches of security or security incidents;
- (f) procedures for the evaluation and testing of security plans and procedures for periodic review and update of the plans;
- (g) measures to ensure the physical security of transport information contained in the security plan; and
- (h) measures to ensure that the distribution of information relating to the transport operation contained in the security plan is limited to those who need to have it. Such measures shall not preclude the provision of information required elsewhere in ADN.

NOTE: Carriers, consignors and consignees should co-operate with each other and with competent authorities to exchange threat information, apply appropriate security measures and respond to security incidents.

- 1.10.3.3 Operational or technical measures shall be taken on vessels carrying high consequence dangerous goods referred to in 1.10.5 in order to prevent the improper use of the vessel and of the dangerous goods. The application of these protective measures shall not jeopardize emergency response.

NOTE: When appropriate and already fitted, the use of transport telemetry or other tracking methods or devices should be used to monitor the movement of high consequence dangerous goods (see Table 1.10.5).

- 1.10.4 The requirements of 1.10.1, 1.10.2 and 1.10.3 do not apply when the quantities carried in packages on a vessel do not exceed those referred to in 1.1.3.6.1.

1.10.5 High consequence dangerous goods are those listed in the table below and carried in quantities greater than those indicated therein.

Table 1.10.5: List of high consequence dangerous goods

Class	Division	Substance or article	Quantity		
			Tank or cargo tank (litres) ^c	Bulk ^{*/l} (kg) ^d	Goods in packages (kg)
1	1.1	Explosives	a	a	0
	1.2	Explosives	a	a	0
	1.3	Compatibility group C explosives	a	a	0
	1.5	Explosives	0	a	0
1	1.4	Explosives of UN Nos. 0104, 0237, 0255, 0267, 0289, 0361, 0365, 0366, 0440, 0441, 0455, 0456 and 0500	a	a	0
2		Flammable gases (classification codes including only letter F)	3000	a	b
		Toxic gases (classification codes including letter(s) T, TF, TC, TO, TFC or TOC) excluding aerosols	0	a	0
3		Flammable liquids of packing groups I and II	3000	a	b
		Desensitized explosives	0	a	0
4.1		Desensitized explosives	a	a	0
4.2		Packing group I substances	3000	a	b
4.3		Packing group I substances	3000	a	b
5.1		Oxidizing liquids of packing group I	3000	a	b
		Perchlorates, ammonium nitrate, ammonium nitrate fertilisers and ammonium nitrate emulsions or suspensions or gels	3000	3000	b
6.1		Toxic substances of packing group I	0	a	0
6.2		Infectious substances of Category A (UN Nos. 2814 and 2900)	a	0	0
7		Radioactive material	3000 A ₁ (special form) or 3000 A ₂ , as applicable, in Type B(U), B(M) or C packages		
8		Corrosive substances of packing group I	3000	a	b

**/ Bulk means bulk in the vessel, or bulk in a vehicle or a container.*

a Not relevant.

b The provisions of 1.10.3 do not apply, whatever the quantity is.

c A value indicated in this column is applicable only if carriage in tanks is authorized according to chapter 3.2, table A, column 10 or 12 of ADR or RID or if letter "T" is indicated in chapter 3.2, table A, column 8 of ADN. For substances which are not authorized for carriage in tanks, the instruction in this column is not relevant.

d A value indicated in this column is applicable only if carriage in bulk is authorized according to chapter 3.2, table A, column 10 or 17 of ADR or RID, or if letter "B" is indicated in chapter 3.2, table A, column 8 of ADN. For substances which are not authorized for carriage in bulk, the instruction in this column is not relevant.

- 1.10.6 For radioactive material, the provisions of this Chapter are deemed to be complied with when the provisions of the Convention on Physical Protection of Nuclear Material and of IAEA INFCIRC/225 (Rev.4) are applied.

CHAPTERS 1.11 to 1.14

(Reserved)

CHAPTER 1.15**RECOGNITION OF CLASSIFICATION SOCIETIES****1.15.1 General**

In the event of the conclusion of an international agreement concerning more general regulations or the navigation of vessels on inland waterways and containing provisions relating to the full range of activities of classification societies and their recognition, any provision of this Chapter in contradiction with any of the provisions of the said international agreement would, in the relations among Parties to this Agreement which had become parties to the international agreement and as from the day of the entry into force of the latter, automatically be deleted and replaced ipso facto by the relevant provision of the international agreement. This Chapter would become null and void once the international agreement came into force if all Parties to this Agreement became Parties to the international agreement.

1.15.2 Procedure for the recognition of classification societies

1.15.2.1 A classification society which wishes to be recommended for recognition under this Agreement shall submit its application for recognition, in accordance with the provisions of this Chapter, to the competent authority of a Contracting Party.

The classification society shall prepare the relevant information in accordance with the provisions of this Chapter. It shall produce it in, at least, an official language of the State where the application is submitted and in English.

The Contracting Party shall forward the application to the Administrative Committee unless in its opinion the conditions and criteria referred to in 1.15.3 have manifestly not been met.

1.15.2.2 The Administrative Committee shall appoint a Committee of Experts and determine its composition and its rules of procedure. This Committee of Experts shall consider the proposal; it shall determine whether the classification society meets the criteria set out in 1.15.3 and shall make a recommendation to the Administrative Committee within a period of six months.

1.15.2.3 The Administrative Committee shall examine the report of the experts. It shall decide in accordance with the procedure set out in Article 17, 7(c), within one year maximum, whether or not to recommend to the Contracting Parties that they should recognize the classification society in question. The Administrative Committee shall establish a list of the classification societies recommended for recognition by the Contracting Parties.

1.15.2.4 Each Contracting Party may or may not decide to recognize the classification societies in question, only on the basis of the list referred to in 1.15.2.3. The Contracting Party shall inform the Administrative Committee and the other Contracting Parties of its decision.

The Administrative Committee shall update the list of recognitions issued by Contracting Parties.

1.15.2.5 If a Contracting Party considers that a classification society no longer meets the conditions and criteria set out in 1.15.3, it may submit a proposal to the Administrative Committee for withdrawal from the list of recommended societies. Such a proposal shall be substantiated by convincing evidence of a failure to meet the conditions and criteria.

1.15.2.6 The Administrative Committee shall set up a new Committee of Experts following the procedure set out under 1.15.2.2 which shall report to the Administrative Committee within a period of six months.

1.15.2.7 The Administrative Committee may decide, according to Article 17, 7 (c), to withdraw the name of the society in question from the list of societies recommended for recognition.

In such a case the society in question shall immediately be so informed. The Administrative Committee shall also inform all the Contracting Parties that the classification society in question no longer meets the requirements to act as a recognized classification society in the context of the Agreement and shall invite them to take the necessary steps in order to remain in conformity with the requirements of the Agreement.

1.15.3 Conditions and criteria for the recognition of a classification society applying for recognition under this Agreement

A classification society applying for recognition under this Agreement shall meet all the following conditions and criteria:

1.15.3.1 A classification society shall be able to demonstrate extensive knowledge of and experience in the assessment of the design and construction of inland navigation vessels. The society should have comprehensive rules and regulations for the design, construction and periodical inspection of vessels. These rules and regulations shall be published and continuously updated and improved through research and development programmes.

1.15.3.2 Registers of the vessels classified by the classification society shall be published annually.

1.15.3.3 The classification society shall not be controlled by ship-owners or shipbuilders, or by others engaged commercially in the manufacture, fitting out, repair or operation of ships. The classification society shall not be substantially dependent on a single commercial enterprise for its revenue.

1.15.3.4 The headquarters or a branch of the classification society authorized and entitled to give a ruling and to act in all areas incumbent on it under the regulations governing inland navigation shall be located in one of the Contracting Parties.

1.15.3.5 The classification society and its experts shall have a good reputation in inland navigation; the experts shall be able to provide proof of their professional abilities.

1.15.3.6 The classification society:

- shall have sufficient professional staff and engineers for the technical tasks of monitoring and inspection and for the tasks of management, support and research, in proportion to the tasks and the number of vessels classified and sufficient to keep regulations up to date and develop them in the light of quality requirements;
- shall have experts in at least two Contracting Parties.

1.15.3.7 The classification society shall be governed by a code of ethics.

1.15.3.8 The classification society shall have prepared and implemented and shall maintain an effective system of internal quality based on the relevant aspects of internationally recognized quality standards and conforming to the standards EN: 45004:1995 (control mechanisms) and ISO 9001 or EN 29001:1997. The classification society is subject to

certification of its quality system by an independent body of auditors recognized by the administration of the State in which it is located.

1.15.4 Obligations of recommended classification societies

- 1.15.4.1 Recommended classification societies shall undertake to cooperate with each other so as to guarantee the equivalence of their technical standards and their implementation.
- 1.15.4.2 Recommended classification societies shall undertake to bring their requirements into line with the present and future provisions of this Agreement.

CHAPTER 1.16**PROCEDURE FOR THE ISSUE OF THE CERTIFICATE OF APPROVAL****1.16.1 Certificate of approval****1.16.1.1 General**

1.16.1.1.1 Dry cargo vessels carrying dangerous goods in quantities greater than exempted quantities, the vessels referred to in 7.1.2.19.1, tank vessels carrying dangerous goods and the vessels referred to in 7.2.2.19.3 shall be provided with an appropriate certificate of approval.

1.16.1.1.2 The certificate of approval shall be valid for not more than five years, subject to the provisions of 1.16.11.

1.16.1.2 Format of the certificate of approval, particulars to be included

1.16.1.2.1 The certificate of approval shall conform to the model 8.6.1.1 or 8.6.1.3 and include the required particulars, as appropriate. It shall include the date of expiry of the period of validity.

1.16.1.2.2 The certificate of approval shall attest that the vessel has been inspected and has its construction and equipment comply with the applicable provisions of Part 9 of ADN.

1.16.1.2.3 All particulars for amendments to the certificate of approval provided for in these Regulations and in the other regulations drawn up by mutual agreement by the Contracting Parties may be entered in the certificate by the competent authority.

1.16.1.2.4 The competent authority shall include the following particulars in the certificate of approval of double-hull vessels meeting the additional requirements of 9.1.0.80 to 9.1.0.95 or 9.2.0.80 to 9.2.0.95:

“The vessel meets the additional requirements for double-hull vessels of 9.1.0.80 to 9.1.0.95” or “The vessel meets the additional requirements for double-hull vessels of 9.2.0.80 to 9.2.0.95.”

1.16.1.2.5 For tank vessels, the certificate of approval must be supplemented by a list of all the dangerous goods accepted for carriage in the tank vessel, drawn up by the recognized classification society which has classified the vessel.

1.16.1.2.6 When the competent authority issues a certificate of approval for tank vessels, it shall also issue a first loading journal.

1.16.1.3 Provisional certificate of approval

1.16.1.3.1 For a vessel which is not provided with a certificate of approval, a provisional certificate of approval of limited duration may be issued in the following cases, subject to the following conditions:

(a) The vessel complies with the applicable provisions of these Regulations, but the normal certificate of approval could not be issued in time. The provisional certificate of approval shall be valid for an appropriate period but not exceeding three months;

(b) The vessel does not comply with every applicable provision of these Regulations after sustaining damage. In this case the provisional certificate of approval shall be valid

only for a single specified voyage and for a specified cargo. The competent authority may impose additional conditions.

- 1.16.1.3.2 The provisional certificate of approval shall conform to the model in 8.6.1.2 or 8.6.1.4 or a single model certificate combining a provisional certificate of inspection and the provisional certificate of approval provided that the single model certificate contains the same information as the model in 8.6.1.2 or 8.6.1.4 and is approved by the competent authority.

1.16.2 Issue and recognition of certificates of approval

- 1.16.2.1 The certificate of approval referred to in 1.16.1 shall be issued by the competent authority of the Contracting Party where the vessel is registered, or in its absence, of the Contracting Party where it has its home port or, in its absence, of the Contracting Party where the owner is domiciled or in its absence, by the competent authority selected by the owner or his representative.

The other Contracting Parties shall recognize such certificates of approval.

The period of validity shall not exceed five years subject to the provisions of 1.16.10.

- 1.16.2.2 The competent authority of any of the Contracting Parties may request the competent authority of any other Contracting Party to issue a certificate of approval in its stead.

- 1.16.2.3 The competent authority of any of the Contracting Parties may delegate the authority to issue the certificate of approval to an inspection body as defined in 1.16.4.

- 1.16.2.4 The provisional certificate of approval referred to in 1.16.1.3 shall be issued by the competent authority of one of the Contracting Parties for the cases and under the conditions referred to in these Regulations.

The other Contracting Parties shall recognize such provisional certificates of approval.

1.16.3 Inspection procedure

- 1.16.3.1 The competent authority of the Contracting Party shall supervise the inspection of the vessel. Under this procedure, the inspection may be performed by an inspection body designated by the Contracting Party or by a recognized classification society. The inspection body or the recognized classification society shall issue an inspection report certifying that the vessel conforms partially or completely to the provisions of these Regulations.

- 1.16.3.2 This inspection report shall be drawn up in a language accepted by the competent authority and shall contain all the necessary information to enable the certificate to be drawn up.

1.16.4 Inspection body

- 1.16.4.1 Inspection bodies shall be subject to recognition by the Contracting Party administration as expert bodies on the construction and inspection of inland navigation vessels and as expert bodies on the transport of dangerous goods by inland waterway. They shall meet the following criteria:

- Compliance by the body with the requirements of impartiality;
- Existence of a structure and personnel that provide objective evidence of the professional ability and experience of the body;

- Compliance with the material contents of standard EN 45004:1995 supported by detailed inspection procedures.

1.16.4.2 Inspection bodies may be assisted by experts (e.g. an expert in electrical installations) or specialized bodies according to the national provisions applicable (e.g. classification societies).

1.16.4.3 The Administrative Committee shall maintain an up-to-date list of the inspection bodies appointed.

1.16.5 Application for the issue of a certificate of approval

The owner of a vessel, or his representative, who requests a certificate of approval, shall deposit an application with the competent authority referred to in 1.16.2.1. The competent authority shall specify the documents to be submitted to it. In order to obtain a certificate of approval a valid vessel certificate shall accompany the request.

1.16.6 Particulars entered in the certificate of approval and amendments thereto

1.16.6.1 The owner of a vessel, or his representative, shall inform the competent authority of any change in the name of the vessel or change of official number or registration number and shall transmit to it the certificate of approval for amendment.

1.16.6.2 All amendments to the certificate of approval provided for in these Regulations and in the other regulations drawn up by mutual agreement by the Contracting Parties may be entered in the certificate by the competent authority.

1.16.6.3 When the owner of the vessel, or his representative, has the vessel registered in another Contracting Party, he shall request a new certificate of approval from the competent authority of that Contracting Party. The competent authority may issue the new certificate for the remaining period of validity of the existing certificate without making a new inspection of the vessel, provided that the state and the technical specifications of the vessel have not undergone any modification.

1.16.7 Presentation of the vessel for inspection

1.16.7.1 The owner, or his representative, shall present the vessel for inspection unladen, cleaned and equipped; he shall be required to provide such assistance as may be necessary for the inspection, such as providing a suitable launch and personnel, and uncovering those parts of the hull or installations which are not directly accessible or visible.

1.16.7.2 In the case of a first, special or periodical inspection, the inspection body or the recognized classification society may require a dry-land inspection.

1.16.8 First inspection

If a vessel does not yet have a certificate of approval or if the validity of the certificate of approval expired more than six months ago, the vessel shall undergo a first inspection.

1.16.9 Special inspection

If the vessel's hull or equipment has undergone alterations liable to diminish safety in respect of the carriage of dangerous goods, or has sustained damage affecting such safety, the vessel shall be presented without delay by the owner or his representative for further inspection.

1.16.10 Periodic inspection and renewal of the certificate of approval

- 1.16.10.1 To renew the certificate of approval, the owner of the vessel, or his representative, shall present the vessel for a periodic inspection. The owner of the vessel or his representative may request an inspection at any time.
- 1.16.10.2 If the request for a periodic inspection is made during the last year preceding the expiry of the validity of the certificate of approval, the period of validity of the new certificate shall commence when the validity of the preceding certificate of approval expires.
- 1.16.10.3 A periodic inspection may also be requested during a period of six months after the expiry of the certificate of approval.
- 1.16.10.4 The competent authority shall establish the period of validity of the new certificate of approval on the basis of the results of the inspection.

1.16.11 Extension of the certificate of approval without an inspection

By derogation from 1.16.10, at the substantiated request of the owner or his representative, the competent authority may grant an extension of the validity of the certificate of approval of not more than one year without an inspection. This extension shall be granted in writing and shall be kept on board the vessel. Such extensions may be granted only once every two validity periods.

1.16.12 Official inspection

- 1.16.12.1 If the competent authority of a Contracting Party has reason to assume that a vessel which is in its territory may constitute a danger in relation to the transport of dangerous goods, for the persons on board or for shipping or for the environment, it may order an inspection of the vessel in accordance with 1.16.3.
- 1.16.12.2 When exercising this right to inspect, the authorities will make all possible efforts to avoid unduly detaining or delaying a vessel. Nothing in this Agreement affects rights relating to compensation for undue detention or delay. In any instance of alleged undue detention or delay the burden of proof shall lie with the owner or operator of the vessel.

1.16.13 Withholding and return of the certificate of approval

- 1.16.13.1 The certificate of approval may be withdrawn if the vessel is not properly maintained or if the vessel's construction or equipment no longer complies with the applicable provisions of these Regulations.
- 1.16.13.2 The certificate of approval may only be withdrawn by the authority by which it has been issued.

Nevertheless, in the cases referred to in 1.16.2.1 to 1.16.9 above, the competent authority of the State in which the vessel is staying may prohibit its use for the carriage of those dangerous goods for which the certificate is required. For this purpose it may withdraw the certificate until such time as the vessel again complies with the applicable provisions of these Regulations. In that case it shall notify the competent authority which issued the certificate.

- 1.16.13.3 Notwithstanding 1.16.2.2 above, any competent authority may amend or withdraw the certificate of approval at the request of the vessel's owner, provided that it so notifies the competent authority which issued the certificate.

- 1.16.13.4 When an inspection body or a classification society observes, in the course of an inspection, that a vessel or its equipment suffers from serious defects in relation to dangerous goods which might jeopardize the safety of the persons on board or the safety of shipping, or constitute a hazard for the environment, it shall immediately notify the competent authority to which it answers with a view to a decision to withhold the certificate.

If this authority which decided to withdraw the certificate is not the authority which issued the certificate, it shall immediately inform the latter and, where necessary, return the certificate to it if it presumes that the defects cannot be eliminated in the near future.

- 1.16.13.5 When the inspection body or the classification society referred to in 1.16.13.1 above ascertains, by means of a special inspection according to 1.16.9, that these defects have been remedied, the certificate of approval shall be returned by the competent authority to the owner or to his representative.

This inspection may be made at the request of the owner or his representative by another inspection body or another classification society. In this case, the certificate of approval shall be returned through the competent authority to which the inspection body or the classification society answers.

- 1.16.13.6 When a vessel is finally immobilized or scrapped, the owner shall send the certificate of approval back to the competent authority which issued it.

1.16.14 Duplicate copy

In the event of the loss, theft or destruction of the certificate of approval or when it becomes unusable for other reasons, an application for a duplicate copy, accompanied by appropriate supporting documents, shall be made to the competent authority which issued the certificate.

This authority shall issue a duplicate copy of the certificate of approval, which shall be designated as such.

1.16.15 Register of certificates of approval

- 1.16.15.1 The competent authorities shall assign a serial number to the certificates of approval which they issue. They shall keep a register of all the certificates issued.

- 1.16.15.2 The competent authorities shall keep copies of all the certificates which they have issued and enter all particulars and amendments in them, as well as cancellations and replacements of certificates.

PART 2

Classification

CHAPTER 2.1

GENERAL PROVISIONS

2.1.1 Introduction

2.1.1.1 The classes of dangerous goods according to ADN are the following:

Class 1	Explosive substances and articles
Class 2	Gases
Class 3	Flammable liquids
Class 4.1	Flammable solids, self-reactive substances and solid desensitized explosives
Class 4.2	Substances liable to spontaneous combustion
Class 4.3	Substances which, in contact with water, emit flammable gases
Class 5.1	Oxidizing substances
Class 5.2	Organic peroxides
Class 6.1	Toxic substances
Class 6.2	Infectious substances
Class 7	Radioactive material
Class 8	Corrosive substances
Class 9	Miscellaneous dangerous substances and articles

2.1.1.2 Each entry in the different classes has been assigned a UN number. The following types of entries are used:

A. Single entries for well defined substances or articles including entries for substances covering several isomers, e.g.:

UN No. 1090	ACETONE
UN No. 1104	AMYL ACETATES
UN No. 1194	ETHYL NITRITE SOLUTION

B. Generic entries for a well defined group of substances or articles, which are not n.o.s. entries, e.g.:

UN No. 1133	ADHESIVES
UN No. 1266	PERFUMERY PRODUCTS
UN No. 2757	CARBAMATE PESTICIDE, SOLID, TOXIC
UN No. 3101	ORGANIC PEROXIDE TYPE B, LIQUID

C. Specific n.o.s. entries covering a group of substances or articles of a particular chemical or technical nature, not otherwise specified, e.g.:

UN No. 1477	NITRATES, INORGANIC, N.O.S.
UN No. 1987	ALCOHOLS, N.O.S.

D. General n.o.s. entries covering a group of substances or articles having one or more dangerous properties, not otherwise specified, e.g.:

UN No. 1325	FLAMMABLE SOLID, ORGANIC, N.O.S.
UN No. 1993	FLAMMABLE LIQUID, N.O.S.

The entries defined under B., C. and D. are defined as collective entries.

2.1.1.3 For packing purposes, substances other than those of Classes 1, 2, 5.2, 6.2 and 7, and other than self-reactive substances of Class 4.1 are assigned to packing groups in accordance with the degree of danger they present:

Packing group I: Substances presenting high danger;
Packing group II: Substances presenting medium danger;
Packing group III: Substances presenting low danger.

The packing group(s) to which a substance is assigned is (are) indicated in Table A of Chapter 3.2.

2.1.1.4 For the purpose of carriage in tank vessels, some substances may be further subdivided.

2.1.2 Principles of classification

2.1.2.1 The dangerous goods covered by the heading of a class are defined on the basis of their properties according to sub-section 2.2.x.1 of the relevant class. Assignment of dangerous goods to a class and a packing group is made according to the criteria mentioned in the same sub-section 2.2.x.1. Assignment of one or several subsidiary risk(s) to a dangerous substance or article is made according to the criteria of the class or classes corresponding to those risks, as mentioned in the appropriate sub-section(s) 2.2.x.1.

2.1.2.2 All dangerous goods entries are listed in Table A of Chapter 3.2 in the numerical order of their UN Number. This table contains relevant information on the goods listed, such as name, class, packing group(s), label(s) to be affixed, packing and carriage provisions^a.

2.1.2.3 Dangerous goods which are listed or defined in sub-section 2.2.x.2 of each class are not to be accepted for carriage.

2.1.2.4 Goods not mentioned by name, i.e. goods not listed as single entries in Table A of Chapter 3.2 and not listed or defined in one of the above-mentioned sub-sections 2.2.x.2 shall be assigned to the relevant class in accordance with the procedure of section 2.1.3. In addition, the subsidiary risk (if any) and the packing group (if any) shall be determined. Once the class, subsidiary risk (if any) and packing group (if any) have been established the relevant UN number shall be determined. The decision trees in sub-sections 2.2.x.3 (list of collective entries) at the end of each class indicate the relevant parameters for selecting the relevant collective entry (UN number). In all cases the most specific collective entry covering the properties of the substance or article shall be selected, according to the hierarchy indicated in 2.1.1.2 by the letters B, C and D respectively. If the substance or article cannot be classified under entries of type B or C according to 2.1.1.2, then, and only then shall it be classified under an entry of type D.

2.1.2.5 On the basis of the test procedures of Chapter 2.3 and the criteria set out in sub-sections 2.2.x.1 of the various classes when it is so specified, it may be determined that a substance, solution or mixture of a certain class, mentioned by name in Table A of Chapter 3.2, does not meet the criteria of that class. In such a case, the substance, solution or mixture is deemed not to belong to that class.

2.1.2.6 For the purposes of classification, substances with a melting point or initial melting point of 20 °C or lower at a pressure of 101.3 kPa shall be considered to be liquids. A viscous substance for which a specific melting point cannot be determined shall be subjected to the ASTM D 4359-90 test or to the test for determining fluidity (penetrometer test) prescribed in 2.3.4.

^a **Note by the secretariat:** An alphabetic list of these entries has been prepared by the secretariat and is reproduced in Table B of Chapter 3.2. This table is not an official part of the ADN.

2.1.3 Classification of substances, including solutions and mixtures (such as preparations and wastes), not mentioned by name

2.1.3.1 Substances including solutions and mixtures not mentioned by name shall be classified according to their degree of danger on the basis of the criteria mentioned in sub-section 2.2.x.1 of the various classes. The danger(s) presented by a substance shall be determined on the basis of its physical and chemical characteristics and physiological properties. Such characteristics and properties shall also be taken into account when such experience leads to a more stringent assignment.

2.1.3.2 A substance not mentioned by name in Table A of Chapter 3.2 presenting a single hazard shall be classified in the relevant class under a collective entry listed in sub-section 2.2.x.3 of that class.

2.1.3.3 A solution or mixture containing only one dangerous substance mentioned by name in Table A of Chapter 3.2, together with one or more non-dangerous substance(s), shall be regarded as the dangerous substance listed by name, unless:

- (a) the solution or mixture is specifically mentioned by name in Table A of Chapter 3.2; or
- (b) it is quite clear from the entry for the dangerous substance that it is applicable only to the pure or technically pure substance; or
- (c) the class, physical state or packing group of the solution or mixture is different from that of the dangerous substance.

In the cases referred to under (b) or (c) above, the solution or mixture shall be classified as a substance not mentioned by name in the relevant class under a collective entry listed in sub-section 2.2.x.3 of that class taking account of the subsidiary risks presented by that solution or mixture, if any, unless the solution or mixture do not meet the criteria of any class, in which case they are not subject to ADN.

2.1.3.4 Solutions and mixtures containing a substance belonging to one of the entries mentioned in 2.1.3.4.1 or 2.1.3.4.2 shall be classified in accordance with the provisions of these paragraphs.

2.1.3.4.1 Solutions and mixtures containing one of the following substances mentioned by name shall always be classified under the same entry as the substance they contain, provided they do not have the hazard characteristics as indicated in 2.1.3.5.3:

– Class 3

UN No. 1921 PROPYLENEIMINE, STABILIZED;

UN No. 2481 ETHYL ISOCYANATE;

UN No. 3064 NITROGLYCERIN SOLUTION IN ALCOHOL with more than 1% but not more than 5% nitroglycerin;

– Class 6.1

UN No. 1051 HYDROGEN CYANIDE, STABILIZED, containing less than 3% water;

UN No. 1185 ETHYLENEIMINE, STABILIZED;

UN No. 1259 NICKEL CARBONYL;

UN No. 1613 HYDROCYANIC ACID, AQUEOUS SOLUTION (HYDROGEN CYANIDE, AQUEOUS SOLUTION) with not more than 20% hydrogen cyanide;

UN No. 1614 HYDROGEN CYANIDE, STABILIZED, containing not more than 3% water and absorbed in a porous inert material;

UN No. 1994 IRON PENTACARBONYL;

UN No. 2480 METHYL ISOCYANATE;

UN No. 3294 HYDROGEN CYANIDE, SOLUTION IN ALCOHOL, with not more than 45% hydrogen cyanide;

– Class 8

UN No. 1052 HYDROGEN FLUORIDE, ANHYDROUS;

UN No. 1744 BROMINE or UN No. 1744 BROMINE SOLUTION;

UN No. 1790 HYDROFLUORIC ACID with more than 85% hydrogen fluoride;

UN No. 2576 PHOSPHORUS OXYBROMIDE, MOLTEN.

2.1.3.4.2 Solutions and mixtures containing a substance belonging to one of the following entries of Class 9:

UN No. 2315 POLYCHLORINATED BIPHENYLS, LIQUID;

UN No. 3151 POLYHALOGENATED BIPHENYLS, LIQUID;

UN No. 3151 POLYHALOGENATED TERPHENYLS, LIQUID;

UN No. 3152 POLYHALOGENATED BIPHENYLS, SOLID;

UN No. 3152 POLYHALOGENATED TERPHENYLS, SOLID; or

UN No. 3432 POLYCHLORINATED BIPHENYLS, SOLID

shall always be classified under the same entry of Class 9 provided that:

- they do not contain any additional dangerous component other than components of packing group III of classes 3, 4.1, 4.2, 4.3, 5.1, 6.1 or 8; and
- they do not have the hazard characteristics as indicated in 2.1.3.5.3.

2.1.3.5 Substances not mentioned by name in Table A of Chapter 3.2, having more than one hazard characteristic and solutions or mixtures containing several dangerous substances shall be classified under a collective entry (see 2.1.2.4) and packing group of the appropriate class in accordance with their hazard characteristics. Such classification according to the hazard characteristics shall be carried out as follows:

- 2.1.3.5.1 The physical and chemical characteristics and physiological properties shall be determined by measurement or calculation and the substance, solution or mixture shall be classified according to the criteria mentioned in sub-section 2.2.x.1 of the various classes.
- 2.1.3.5.2 If this determination is not possible without disproportionate cost or effort (as for some kinds of wastes), the substance, solution or mixture shall be classified in the class of the component presenting the major hazard.
- 2.1.3.5.3 If the hazard characteristics of the substance, solution or mixture fall within more than one class or group of substances listed below then the substance, solution or mixture shall be classified in the class or group of substances corresponding to the major hazard on the basis of the following order of precedence:
- (a) Material of Class 7 (apart from radioactive material in excepted packages where the other hazardous properties take precedence);
 - (b) Substances of Class 1;
 - (c) Substances of Class 2;
 - (d) Liquid desensitized explosives of Class 3;
 - (e) Self-reactive substances and solid desensitized explosives of Class 4.1;
 - (f) Pyrophoric substances of Class 4.2;
 - (g) Substances of Class 5.2;
 - (h) Substances of Class 6.1 or Class 3 which, on the basis of their inhalation toxicity, are to be classified under packing group I (Substances meeting the classification criteria of Class 8 and having an inhalation toxicity of dust and mist (LC₅₀) in the range of packing group I and a toxicity through oral ingestion or dermal contact only in the range of packing group III or less, shall be allocated to Class 8);
 - (i) Infectious substances of Class 6.2.
- 2.1.3.5.4 If the hazard characteristics of the substance fall within more than one class or group of substances not listed in 2.1.3.5.3 above, the substance shall be classified in accordance with the same procedure but the relevant class shall be selected according to the precedence of hazards table in 2.1.3.10.
- 2.1.3.5.5 If the substance to be carried is a waste, with a composition that is not precisely known, its assignment to a UN number and packing group in accordance with 2.1.3.5.2 may be based on the consignor's knowledge of the waste, including all available technical and safety data as requested by safety and environmental legislation in force.*

In case of doubt, the highest danger level shall be taken.

If however, on the basis of the knowledge of the composition of the waste and the physical and chemical properties of the identified components, it is possible to demonstrate that the

* Such legislation is for instance the Commission Decision 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste (replaced by the Directive of the European Parliament and of the Council 2006/12/EC (Official Journal of the European Communities No. L 114 of 27 April 2006, page 9) and Council Decision 94/904/EC establishing a list of hazardous wastes pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous wastes (Official Journal of the European Communities No. L 226 of 6 September 2000, page 3).

properties of the waste do not correspond to the properties of the packing group I level, the waste may be classified by default in the most appropriate n.o.s. entry of packing group II.

This procedure may not be used for wastes containing substances mentioned in 2.1.3.5.3, substances of Class 4.3, substances of the case mentioned in 2.1.3.7 or substances which are not accepted for carriage in accordance with 2.2.x.2.

- 2.1.3.6 The most specific applicable collective entry (see 2.1.2.4) shall always be used, i.e. a general n.o.s. entry shall only be used if a generic entry or a specific n.o.s. entry cannot be used.
- 2.1.3.7 Solutions and mixtures of oxidizing substances or substances with an oxidizing subsidiary risk may have explosive properties. In such a case they are not to be accepted for carriage unless they meet the requirements for Class 1.
- 2.1.3.8 Substances of Classes 1 to 9, other than UN Nos. 3077 and 3082, meeting the criteria of 2.2.9.1.10 shall, additionally to their hazards of Classes 1 to 9, be considered to be environmentally hazardous substances. Other substances meeting the criteria of 2.2.9.1.10.1 or 2.2.9.1.10.2 shall be assigned to UN Nos. 3077 or 3082 or to identification Nos. 9005 or 9006, as appropriate.
- 2.1.3.9 Wastes which do not meet the criteria for classification in classes 1 to 9 but are covered by the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal* may be carried under UN Nos. 3077 or 3082.

2.1.3.10 Table of precedence of hazards

Class and packing group	4.1, II	4.1, III	4.2, II	4.2, III	4.3, I	4.3, II	4.3, III	5.1, I	5.1, II	5.1, III	6.1, I DERMAL	6.1, I ORAL	6.1, II	6.1, III	8, I	8, II	8, III	9
3, I	SOL LIQ 4.1 3, I	SOL LIQ 4.1 3, I	SOL LIQ 4.2 3, I	SOL LIQ 4.2 3, I	4.3, I	4.3, I	4.3, I	SOL LIQ 5.1, I 3, I	SOL LIQ 5.1, I 3, I	SOL LIQ 5.1, I 3, I	3, I	3, I	3, I	3, I	3, I	3, I	3, I	3, I
3, II	SOL LIQ 4.1 3, II	SOL LIQ 4.1 3, II	SOL LIQ 4.2 3, II	SOL LIQ 4.2 3, II	4.3, I	4.3, II	4.3, II	SOL LIQ 5.1, I 3, I	SOL LIQ 5.1, II 3, II	SOL LIQ 5.1, II 3, II	3, I	3, I	3, II	3, II	8, I	3, II	3, II	3, II
3, III	SOL LIQ 4.1 3, III	SOL LIQ 4.1 3, III	SOL LIQ 4.2 3, II	SOL LIQ 4.2 3, III	4.3, I	4.3, II	4.3, III	SOL LIQ 5.1, I 3, I	SOL LIQ 5.1, II 3, II	SOL LIQ 5.1, III 3, III	6.1, I	6.1, I	6.1, II	3, III */	8, I	8, II	3, III	3, III
4.1, II			4.2, II	4.2, II	4.3, I	4.3, II	4.3, II	5.1, I	4.1, II	4.1, II	6.1, I	6.1, I	SOL LIQ 4.1, II 6.1, II	SOL LIQ 4.1, II 6.1, II	8, I	SOL LIQ 4.1, II 8, II	SOL LIQ 4.1, II 8, II	4.1, II
4.1, III			4.2, II	4.2, III	4.3, I	4.3, II	4.3, III	5.1, I	4.1, II	4.1, III	6.1, I	6.1, I	6.1, II	SOL LIQ 4.1, III 6.1, III	8, I	8, II	SOL LIQ 4.1, III 8, III	4.1, III
4.2, II					4.3, I	4.3, II	4.3, II	5.1, I	4.2, II	4.2, II	6.1, I	6.1, I	4.2, II	4.2, II	8, I	4.2, II	4.2, II	4.2, II
4.2, III					4.3, I	4.3, II	4.3, III	5.1, I	5.1, II	4.2, III	6.1, I	6.1, I	6.1, II	4.2, III	8, I	8, II	4.2, III	4.2, III
4.3, I								5.1, I	4.3, I	4.3, I	6.1, I	4.3, I	4.3, I	4.3, I	4.3, I	4.3, I	4.3, I	4.3, I
4.3, II								5.1, I	4.3, II	4.3, II	6.1, I	4.3, I	4.3, II	4.3, II	8, I	4.3, II	4.3, II	4.3, II
4.3, III								5.1, I	5.1, II	4.3, III	6.1, I	6.1, I	6.1, II	4.3, III	8, I	8, II	4.3, III	4.3, III
5.1, I											5.1, I	5.1, I	5.1, I	5.1, I	5.1, I	5.1, I	5.1, I	5.1, I
5.1, II											6.1, I	5.1, II	5.1, II	5.1, II	8, I	5.1, II	5.1, II	5.1, II
5.1, III											6.1, I	6.1, I	6.1, II	5.1, III	8, I	8, II	5.1, III	5.1, III
6.1, I DERMA															SOL LIQ 6.1, I 8, I	6.1, I	6.1, I	6.1, I
6.1, I ORAL															SOL LIQ 6.1, I 8, I	6.1, I	6.1, I	6.1, I
6.1, II INHAL															SOL LIQ 6.1, I 8, I	6.1, II	6.1, II	6.1, II
6.1, II DERMA															SOL LIQ 6.1, I 8, I	SOL LIQ 6.1, II 8, II	6.1, II	6.1, II
6.1, II ORAL															8, I	SOL LIQ 6.1, II 8, II	6.1, II	6.1, II
6.1, III															8, I	8, II	8, III	6.1, III
8, I																		8, I
8, II																		8, II
8, III																		8, III

SOL = Solid substances and mixtures
LIQ = Liquid substances, mixtures and solutions
DERMAL = Dermal toxicity
ORAL = Oral toxicity
INHAL = Inhalation toxicity
*/ Class 6.1 for pesticides

NOTE 1: Examples to explain the use of the table**Classification of a single substance**

Description of the substance to be classified:

An amine not mentioned by name meeting the criteria for Class 3, packing group II as well as those for Class 8, packing group I.

Procedure:

The intersection of line 3 II with column 8 I gives 8 I.

This amine has therefore to be classified in Class 8 under:

*UN No. 2734 AMINES LIQUID, CORROSIVE, FLAMMABLE, N.O.S. or UN No. 2734 POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.
packing group I*

Classification of a mixture

Description of the mixture to be classified:

Mixture consisting of a flammable liquid classified in Class 3, packing group III, a toxic substance in Class 6.1, packing group II and a corrosive substance in Class 8, packing group I.

Procedure

The intersection of line 3 III with column 6.1 II gives 6.1 II.

The intersection of line 6.1 II with column 8 I gives 8 I LIQ.

This mixture not further defined has therefore to be classified in Class 8 under:

*UN No. 2922 CORROSIVE LIQUID, TOXIC, N.O.S.
packing group I.*

NOTE 2: Examples for the classification of mixtures and solutions under a class and a packing group:

A phenol solution of Class 6.1, (II), in benzene of Class 3, (II) is to be classified in Class 3, (II); this solution is to be classified under UN No. 1992 FLAMMABLE LIQUID, TOXIC, N.O.S., Class 3, (II), by virtue of the toxicity of the phenol.

A solid mixture of sodium arsenate of Class 6.1, (II) and sodium hydroxide of Class 8, (II) is to be classified under UN No. 3290 TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S., in Class 6.1 (II).

A solution of crude or refined naphthalene of Class 4.1, (III) in petrol of Class 3, (II), is to be classified under UN No. 3295 HYDROCARBONS, LIQUID, N.O.S. in Class 3, (II).

A mixture of hydrocarbons of Class 3, (III), and of polychlorinated biphenyls (PCB) of Class 9, (II), is to be classified under UN No. 2315 POLYCHLORINATED BIPHENYLS, LIQUID or UN No. 3432 POLYCHLORINATED BIPHENYLS, SOLID in Class 9, (II).

A mixture of propyleneimine of Class 3, and polychlorinated biphenyls (PCB) of Class 9, (II), is to be classified under UN No. 1921 PROPYLENEIMINE, INHIBITED in Class 3.

2.1.4 Classification of samples

2.1.4.1 When the class of a substance is uncertain and it is being carried for further testing, a tentative class, proper shipping name and UN number shall be assigned on the basis of the consignor's knowledge of the substance and application of:

- (a) the classification criteria of Chapter 2.2; and
- (b) the requirements of this Chapter.

The most severe packing group possible for the proper shipping name chosen shall be used.

Where this provision is used the proper shipping name shall be supplemented with the word "SAMPLE" (e.g., "FLAMMABLE LIQUID, N.O.S., SAMPLE"). In certain instances, where a specific proper shipping name is provided for a sample of a substance considered to meet certain classification criteria (e.g., GAS SAMPLE, NON-PRESSURIZED, FLAMMABLE, UN No. 3167) that proper shipping name shall be used. When an N.O.S. entry is used to carry the sample, the proper shipping name need not be supplemented with the technical name as required by special provision 274 of Chapter 3.3.

2.1.4.2 Samples of the substance shall be carried in accordance with the requirements applicable to the tentative assigned proper shipping name provided:

- (a) the substance is not considered to be a substance not accepted for carriage by sub-sections 2.2.x.2 of Chapter 2.2 or by Chapter 3.2;
- (b) the substance is not considered to meet the criteria for Class 1 or considered to be an infectious substance or a radioactive material;
- (c) the substance is in compliance with 2.2.41.1.15 or 2.2.52.1.9 if it is a self-reactive substance or an organic peroxide, respectively;
- (d) the sample is carried in a combination packaging with a net mass per package not exceeding 2.5 kg; and
- (e) the sample is not packed together with other goods.

CHAPTER 2.2

CLASS SPECIFIC PROVISIONS

2.2.1 Class 1 Explosive substances and articles**2.2.1.1 Criteria**

2.2.1.1.1 The heading of Class 1 covers:

- (a) Explosive substances: solid or liquid substances (or mixtures of substances) capable by chemical reaction of producing gases at such a temperature and pressure and at such a speed as to cause damage to the surroundings.

Pyrotechnic substances: substances or mixtures of substances designed to produce an effect by heat, light, sound, gas or smoke or a combination of these as the result of non-detonating self-sustaining exothermic chemical reactions.

NOTE 1: Substances which are not themselves explosive but which may form an explosive mixture of gas, vapour or dust are not substances of Class 1.

NOTE 2: Also excluded from Class 1 are: water- or alcohol-wetted explosives of which the water or alcohol content exceeds the limits specified and those containing plasticizers - these explosives are assigned to Class 3 or Class 4.1 - and those explosives which, on the basis of their predominant hazard, are assigned to Class 5.2.

- (b) Explosive articles: articles containing one or more explosive or pyrotechnic substances.

NOTE: Devices containing explosive or pyrotechnic substances in such small quantity or of such a character that their inadvertent or accidental ignition or initiation during carriage would not cause any manifestation external to the device by projection, fire, smoke, heat or loud noise are not subject to the requirements of Class 1.

- (c) Substances and articles not mentioned above which are manufactured with a view to producing a practical effect by explosion or a pyrotechnic effect.

2.2.1.1.2 Any substance or article having or suspected of having explosive properties shall be considered for assignment to Class 1 in accordance with the tests, procedures and criteria prescribed in Part I, Manual of Tests and Criteria.

A substance or article assigned to Class 1 can only be accepted for carriage when it has been assigned to a name or n.o.s. entry listed in Table A of Chapter 3.2 and meets the criteria of the Manual of Tests and Criteria.

2.2.1.1.3 The substances and articles of Class 1 shall be assigned to a UN Number and a name or n.o.s. entry listed in Table A of Chapter 3.2. Interpretation of the names of substances and articles in Table A of Chapter 3.2 shall be based upon the glossary in 2.2.1.1.8.

Samples of new or existing explosive substances or articles carried for purposes including: testing, classification, research and development quality control, or as a commercial sample, other than initiating explosive, may be assigned to UN No. 0190 SAMPLES, EXPLOSIVE.

The assignment of explosive substances and articles not mentioned by name as such in Table A of Chapter 3.2 to an n.o.s. entry of Class 1 or UN No. 0190 SAMPLES, EXPLOSIVE as well as the assignment of certain substances the carriage of which is subject

to a specific authorization by the competent authority according to the special provisions referred to in Column (6) of Table A of Chapter 3.2 shall be made by the competent authority of the country of origin. This competent authority shall also approve in writing the conditions of carriage of these substances and articles. If the country of origin is not a Contracting Party to ADN, the classification and the conditions of carriage shall be recognized by the competent authority of the first country Contracting Party to ADN reached by the consignment.

2.2.1.1.4 Substances and articles of Class 1 shall have been assigned to a division in accordance with 2.2.1.1.5 and to a compatibility group in accordance with 2.2.1.1.6. The division shall be based on the results of the tests described in section 2.3.1 applying the definitions in 2.2.1.1.5. The compatibility group shall be determined in accordance with the definitions in 2.2.1.1.6. The classification code shall consist of the division number and the compatibility group letter.

2.2.1.1.5 *Definition of divisions*

Division 1.1 Substances and articles which have a mass explosion hazard (a mass explosion is an explosion which affects almost the entire load virtually instantaneously).

Division 1.2 Substances and articles which have a projection hazard but not a mass explosion hazard.

Division 1.3 Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard:

(a) combustion of which gives rise to considerable radiant heat; or

(b) which burn one after another, producing minor blast or projection effects or both.

Division 1.4 Substances and articles which present only a slight risk of explosion in the event of ignition or initiation during carriage. The effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package.

Division 1.5 Very insensitive substances having a mass explosion hazard which are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of carriage. As a minimum requirement they must not explode in the external fire test.

Division 1.6 Extremely insensitive articles which do not have a mass explosion hazard. The articles contain only extremely insensitive detonating substances and demonstrate a negligible probability of accidental initiation or propagation.

NOTE: The risk from articles of Division 1.6 is limited to the explosion of a single article.

2.2.1.1.6 *Definition of compatibility groups of substances and articles*

- A Primary explosive substance.
- B Article containing a primary explosive substance and not having two or more effective protective features. Some articles, such as detonators for blasting, detonator assemblies for blasting and primers, cap-type, are included, even though they do not contain primary explosives.
- C Propellant explosive substance or other deflagrating explosive substance or article containing such explosive substance.
- D Secondary detonating explosive substance or black powder or article containing a secondary detonating explosive substance, in each case without means of initiation and without a propelling charge, or article containing a primary explosive substance and having two or more effective protective features.
- E Article containing a secondary detonating explosive substance, without means of initiation, with a propelling charge (other than one containing a flammable liquid or gel or hypergolic liquids).
- F Article containing a secondary detonating explosive substance with its own means of initiation, with a propelling charge (other than one containing a flammable liquid or gel or hypergolic liquids) or without a propelling charge.
- G Pyrotechnic substance, or article containing a pyrotechnic substance, or article containing both an explosive substance and an illuminating, incendiary, tear- or smoke-producing substance (other than a water-activated article or one which contains white phosphorus, phosphides, a pyrophoric substance, a flammable liquid or gel or hypergolic liquids).
- H Article containing both an explosive substance and white phosphorus.
- J Article containing both an explosive substance and a flammable liquid or gel.
- K Article containing both an explosive substance and a toxic chemical agent.
- L Explosive substance or article containing an explosive substance and presenting a special risk (e.g. due to water activation or the presence of hypergolic liquids, phosphides or a pyrophoric substance) necessitating isolation of each type.
- N Articles containing only extremely insensitive detonating substances.
- S Substance or article so packed or designed that any hazardous effects arising from accidental functioning are confined within the package unless the package has been degraded by fire, in which case all blast or projection effects are limited to the extent that they do not significantly hinder or prevent fire-fighting or other emergency response efforts in the immediate vicinity of the package.

NOTE 1: Each substance or article, packed in a specified packaging, may be assigned to one compatibility group only. Since the criterion of compatibility group S is empirical, assignment to this group is necessarily linked to the tests for assignment of a classification code.

NOTE 2: Articles of compatibility groups D and E may be fitted or packed together with their own means of initiation provided that such means have at least two effective protective

features designed to prevent an explosion in the event of accidental functioning of the means of initiation. Such packages shall be assigned to compatibility groups D or E.

NOTE 3: Articles of compatibility groups D and E may be packed together with their own means of initiation, which do not have two effective protective features (i.e. means of initiation assigned to compatibility group B), provided that they comply with mixed packing provision MP 21 of Section 4.1.10 of ADR.. Such packages shall be assigned to compatibility groups D or E.

NOTE 4: Articles may be fitted or packed together with their own means of ignition provided that the means of ignition cannot function during normal conditions of carriage.

NOTE 5: Articles of compatibility groups C, D and E may be packed together. Such packages shall be assigned to compatibility group E.

2.2.1.1.7 Assignment of fireworks to divisions

2.2.1.1.7.1 Fireworks shall normally be assigned to divisions 1.1, 1.2, 1.3, and 1.4 on the basis of test data derived from Test Series 6 of the Manual of Tests and Criteria. However, since the range of such articles is very extensive and the availability of test facilities may be limited, assignment to divisions may also be made in accordance with the procedure in 2.2.1.1.7.2.

2.2.1.1.7.2 Assignment of fireworks to UN No. 0333, 0334, 0335 or 0336 may be made on the basis of analogy, without the need for Test Series 6 testing, in accordance with the default fireworks classification table in 2.2.1.1.7.5. Such assignment shall be made with the agreement of the competent authority. Items not specified in the table shall be classified on the basis of test data derived from Test Series 6.

NOTE 1: The addition of other types of fireworks to column 1 of the table in 2.2.1.1.7.5 shall only be made on the basis of full test data submitted to the UN Sub-Committee of Experts on the Transport of Dangerous Goods for consideration.

NOTE 2: Test data derived by competent authorities which validates, or contradicts the assignment of fireworks specified in column 4 of the table in 2.2.1.1.7.5 to divisions in column 5 should be submitted to the UN Sub-Committee of Experts on the Transport of Dangerous Goods for information.

2.2.1.1.7.3 Where fireworks of more than one division are packed in the same package they shall be classified on the basis of the highest division unless test data derived from Test Series 6 indicate otherwise.

2.2.1.1.7.4 The classification shown in the table in 2.2.1.1.7.5 applies only for articles packed in fibreboard boxes (4G).

2.2.1.1.7.5 Default fireworks classification table¹

NOTE 1: References to percentages in the table, unless otherwise stated, are to the mass of all pyrotechnic composition (e.g. rocket motors, lifting charge, bursting charge and effect charge).

NOTE 2: "Flash composition" in this table refers to pyrotechnic compositions in powder form or as pyrotechnic units as presented in the fireworks, that are used to produce an aural effect, or used as a bursting charge or lifting charge, unless the time taken for the pressure

¹ This table contains a list of firework classifications which may be used in the absence of Test Series 6 data (see 2.2.1.1.7.2).

rise is demonstrated to be more than 8 ms for 0.5 g of pyrotechnic composition in Test Series 2(c)(i) "Time/pressure test" of the Manual of Tests and Criteria.

NOTE 3: *Dimensions in mm refer to:*

- *for spherical and peanut shells the diameter of the sphere of the shell;*
- *for cylinder shells the length of the shell;*
- *for a shell in mortar, Roman candle, shot tube firework or mine the inside diameter of the tube comprising or containing the firework;*
- *for a bag mine or cylinder mine, the inside diameter of the mortar intended to contain the mine.*

Type	Includes: / Synonym:	Definition	Specification	Classification
Shell, spherical or cylindrical	Spherical display shell: aerial shell, colour shell, dye shell, multi-break shell, multi-effect shell, nautical shell, parachute shell, smoke shell, star shell; report shell: maroon, salute, sound shell, thunderclap, aerial shell kit	Device with or without propellant charge, with delay fuse and bursting charge, pyrotechnic unit(s) or loose pyrotechnic composition and designed to be projected from a mortar	All report shells	1.1G
			Colour shell: ≥ 180 mm	1.1G
			Colour shell: < 180 mm with $> 25\%$ flash composition, as loose powder and/or report effects	1.1G
			Colour shell: < 180 mm with $\leq 25\%$ flash composition, as loose powder and/or report effects	1.3G
	Peanut shell	Device with two or more spherical aerial shells in a common wrapper propelled by the same propellant charge with separate external delay fuses	Colour shell: ≤ 50 mm, or ≤ 60 g pyrotechnic composition, with $\leq 2\%$ flash composition as loose powder and/or report effects	1.4G
			The most hazardous spherical aerial shell determines the classification	
	Preloaded mortar, shell in mortar	Assembly comprising a spherical or cylindrical shell inside a mortar from which the shell is designed to be projected	All report shells	1.1G
			Colour shell: ≥ 180 mm	1.1G
			Colour shell: $> 25\%$ flash composition as loose powder and/or report effects	1.1G
			Colour shell: > 50 mm and < 180 mm	1.2G
		Colour shell: ≤ 50 mm, or ≤ 60 g pyrotechnic composition, with $\leq 25\%$ flash composition as loose powder and/or report effects	1.3G	

Type	Includes: / Synonym:	Definition	Specification	Classification
Shell, spherical or cylindrical (cont'd)	Shell of shells (spherical) (<i>Reference to percentages for shell of shells are to the gross mass of the fireworks article</i>)	Device without propellant charge, with delay fuse and bursting charge, containing report shells and inert materials and designed to be projected from a mortar	> 120 mm	1.1G
		Device without propellant charge, with delay fuse and bursting charge, containing report shells $\leq 25g$ flash composition per report unit, with $\leq 33\%$ flash composition and $\geq 60\%$ inert materials and designed to be projected from a mortar	≤ 120 mm	1.3G
		Device without propellant charge, with delay fuse and bursting charge, containing colour shells and/or pyrotechnic units and designed to be projected from a mortar	> 300 mm	1.1G
		Device without propellant charge, with delay fuse and bursting charge, containing colour shells $\leq 70mm$ and/or pyrotechnic units, with $\leq 25\%$ flash composition and $\leq 60\%$ pyrotechnic composition and designed to be projected from a mortar	> 200 mm and ≤ 300 mm	1.3G
		Device with propellant charge, with delay fuse and bursting charge, containing colour shells ≤ 70 mm and/or pyrotechnic units, with $\leq 25\%$ flash composition and $\leq 60\%$ pyrotechnic composition and designed to be projected from a mortar	≤ 200 mm	1.3G
Battery/ combination	Barrage, bombardos, cakes, finale box, flowerbed, hybrid, multiple tubes, shell cakes, banger batteries, flash banger batteries	Assembly including several elements either containing the same type or several types each corresponding to one of the types of fireworks listed in this table, with one or two points of ignition	The most hazardous firework type determines the classification	

Type	Includes: / Synonym:	Definition	Specification	Classification
Roman candle	Exhibition candle, candle, bombettes	Tube containing a series of pyrotechnic units consisting of alternate pyrotechnic composition, propellant charge, and transmitting fuse	<p>≥ 50 mm inner diameter, containing flash composition, or < 50 mm with > 25% flash composition</p> <p>≥ 50 mm inner diameter, containing no flash composition</p> <p>< 50 mm inner diameter and ≤ 25% flash composition</p> <p>≤ 30 mm inner diameter, each pyrotechnic unit ≤ 25 g and ≤ 5% flash composition</p>	1.1G 1.2G 1.3G 1.4G
Shot tube	Single shot Roman candle, small preloaded mortar	Tube containing a pyrotechnic unit consisting of pyrotechnic composition, propellant charge with or without transmitting fuse	<p>≤ 30 mm inner diameter and pyrotechnic unit > 25 g, or > 5% and ≤ 25% flash composition</p> <p>≤ 30 mm inner diameter, pyrotechnic unit ≤ 25 g and ≤ 5% flash composition</p>	1.3G 1.4G
Rocket	Avalanche rocket, signal rocket, whistling rocket, bottle rocket, sky rocket, missile type rocket, table rocket	Tube containing pyrotechnic composition and/or pyrotechnic units, equipped with stick(s) or other means for stabilization of flight, and designed to be propelled into the air	<p>Flash composition effects only</p> <p>Flash composition > 25% of the pyrotechnic composition</p> <p>> 20 g pyrotechnic composition and flash composition ≤ 25%</p> <p>≤ 20 g pyrotechnic composition, black powder bursting charge and ≤ 0.13 g flash composition per report and ≤ 1 g in total</p>	1.1G 1.1G 1.3G 1.4G

Type	Includes: / Synonym:	Definition	Specification	Classification
Mine	Pot-a-feu, ground mine, bag mine, cylinder mine	Tube containing propellant charge and pyrotechnic units and designed to be placed on the ground or to be fixed in the ground. The principal effect is ejection of all the pyrotechnic units in a single burst producing a widely dispersed visual and/or aural effect in the air or: Cloth or paper bag or cloth or paper cylinder containing propellant charge and pyrotechnic units, designed to be placed in a mortar and to function as a mine	> 25% flash composition, as loose powder and/ or report effects ≥ 180 mm and ≤ 25% flash composition, as loose powder and/ or report effects < 180 mm and ≤ 25% flash composition, as loose powder and/ or report effects ≤ 150 g pyrotechnic composition, containing ≤ 5% flash composition as loose powder and/ or report effects. Each pyrotechnic unit ≤ 25 g, each report effect < 2g; each whistle, if any, ≤ 3 g	1.1G 1.1G 1.3G 1.4G
Fountain	Volcanos, gerbs, showers, lances, Bengal fire, flitter sparkle, cylindrical fountains, cone fountains, illuminating torch	Non-metallic case containing pressed or consolidated pyrotechnic composition producing sparks and flame	≥ 1 kg pyrotechnic composition < 1 kg pyrotechnic composition	1.3G 1.4G
Sparkler	Handheld sparklers, non-handheld sparklers, wire sparklers	Rigid wire partially coated (along one end) with slow burning pyrotechnic composition with or without an ignition tip	Perchlorate based sparklers: > 5 g per item or > 10 items per pack Perchlorate based sparklers: ≤ 5 g per item and ≤ 10 items per pack; Nitrate based sparklers: ≤ 30 g per item	1.3G 1.4G
Bengal stick	Dipped stick	Non-metallic stick partially coated (along one end) with slow-burning pyrotechnic composition and designed to be held in the hand	Perchlorate based items: > 5 g per item or > 10 items per pack Perchlorate based items: ≤ 5 g per item and ≤ 10 items per pack; nitrate based items: ≤ 30 g per item	1.3 G 1.4G

Type	Includes: / Synonym:	Definition	Specification	Classification
Low hazard fireworks and novelties	Table bombs, throwdowns, crackling granules, smokes, fog, snakes, glow worm, serpents, snaps, party poppers	Device designed to produce very limited visible and/ or audible effect which contains small amounts of pyrotechnic and/or explosive composition.	Throwdowns and snaps may contain up to 1.6 mg of silver fulminate; snaps and party poppers may contain up to 16 mg of potassium chlorate/red phosphorous mixture; other articles may contain up to 5 g of pyrotechnic composition, but no flash composition	1.4G
Spinner	Aerial spinner, helicopter, chaser, ground spinner	Non-metallic tube or tubes containing gas- or spark-producing pyrotechnic composition, with or without noise producing composition, with or without aerofoils attached	Pyrotechnic composition per item > 20 g, containing ≤ 3% flash composition as report effects, or whistle composition ≤ 5 g	1.3G
Wheels	Catherine wheels, Saxon	Assembly including drivers containing pyrotechnic composition and provided with a means of attaching it to a support so that it can rotate	Pyrotechnic composition per item ≤ 20 g, containing ≤ 3% flash composition as report effects, or whistle composition ≤ 5 g	1.4G
Aerial wheel	Flying Saxon, UFO's, rising crown	Tubes containing propellant charges and sparks-flame- and/or noise producing pyrotechnic compositions, the tubes being fixed to a supporting ring	<p>≥ 1 kg total pyrotechnic composition, no report effect, each whistle (if any) ≤ 25 g and ≤ 50 g whistle composition per wheel</p> <p>< 1 kg total pyrotechnic composition, no report effect, each whistle (if any) ≤ 5 g and ≤ 10 g whistle composition per wheel</p>	1.3G
				1.4G
				1.3G

Type	Includes: / Synonym:	Definition	Specification	Classification
			<p>≤ 200 g total pyrotechnic composition and ≤ 60 g pyrotechnic composition per driver, ≤ 3% flash composition as report effects, each whistle (if any) ≤ 5 g and ≤ 10 g whistle composition per wheel</p> <p>The most hazardous firework type determines the classification</p>	1.4G
Selection pack	Display selection box, display selection pack, garden selection box, indoor selection box; assortment	A pack of more than one type each corresponding to one of the types of fireworks listed in this table		
Firecracker	Celebration cracker, celebration roll, string cracker	Assembly of tubes (paper or cardboard) linked by a pyrotechnic fuse, each tube intended to produce an aural effect	Each tube ≤ 140 mg of flash composition or ≤ 1 g black powder	1.4G
Banger	Salute, flash banger, lady cracker	Non-metallic tube containing report composition intended to produce an aural effect	> 2 g flash composition per item	1.1G
			≤ 2 g flash composition per item and ≤ 10 g per inner packaging	1.3G
			≤ 1 g flash composition per item and ≤ 10 g per inner packaging or ≤ 10 g black powder per item	1.4G

2.2.1.1.8 Glossary of names

NOTE 1: The descriptions in the glossary are not intended to replace the test procedures, nor to determine the hazard classification of a substance or article of Class 1. Assignment to the correct division and a decision on whether Compatibility Group S is appropriate shall be based on testing of the product in accordance with the Manual of Tests and Criteria, Part I or by analogy with similar products which have already been tested and assigned in accordance with the procedures of the Manual of Tests and Criteria.

NOTE 2: The figures given after the names refer to the relevant UN numbers (Column (1) of Table A of Chapter 3.2). For the classification code, see 2.2.1.1.4.

AIR BAG INFLATORS or AIR BAG MODULES or SEAT-BELT PRETENSIONERS:
UN No. 0503

Articles which contain pyrotechnic substances and are used as life-saving vehicle airbags or seat-belts.

AMMUNITION, ILLUMINATING, with or without burster, expelling charge or propelling charge: UN Nos. 0171, 0254, 0297

Ammunition designed to produce a single source of intense light for lighting up an area. The term includes illuminating cartridges, grenades and projectiles; and illuminating and target identification bombs.

NOTE: The following articles: CARTRIDGES, SIGNAL; SIGNAL DEVICES HAND; SIGNALS, DISTRESS; FLARES, AERIAL; FLARES, SURFACE are not included in this definition. They are listed separately.

AMMUNITION, INCENDIARY, liquid or gel, with burster, expelling charge or propelling charge: UN No. 0247

Ammunition containing liquid or gelatinous incendiary substance. Except when the incendiary substance is an explosive per se, it also contains one or more of the following: a propelling charge with primer and igniter charge; a fuze with burster or expelling charge.

AMMUNITION, INCENDIARY, WHITE PHOSPHORUS with burster, expelling charge or propelling charge: UN Nos. 0243, 0244

Ammunition containing white phosphorus as incendiary substance. It also contains one or more of the following: a propelling charge with primer and igniter charge; a fuze with burster or expelling charge.

AMMUNITION, INCENDIARY with or without burster, expelling charge or propelling charge: UN Nos. 0009, 0010, 0300

Ammunition containing incendiary composition. Except when the composition is an explosive per se, it also contains one or more of the following: a propelling charge with primer and igniter charge; a fuze with burster or expelling charge.

AMMUNITION, PRACTICE: UN Nos. 0362, 0488

Ammunition without a main bursting charge, containing a burster or expelling charge. Normally it also contains a fuze and a propelling charge.

NOTE: GRENADES, PRACTICE are not included in this definition. They are listed separately.

AMMUNITION, PROOF: UN No. 0363

Ammunition containing pyrotechnic substances, used to test the performance or strength of new ammunition, weapon components or assemblies.

AMMUNITION, SMOKE, WHITE PHOSPHORUS, with burster, expelling charge or propelling charge: UN Nos. 0245, 0246

Ammunition containing white phosphorus as a smoke-producing substance. It also contains one or more of the following: a propelling charge with primer and igniter charge; a fuze with burster or expelling charge. The term includes grenades, smoke.

AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge: UN Nos. 0015, 0016, 0303

Ammunition containing a smoke-producing substance such as chlorosulphonic acid mixture or titanium tetrachloride; or a smoke-producing pyrotechnic composition based on hexachloroethane or red phosphorus. Except when the substance is an explosive per se, the ammunition also contains one or more of the following: a propelling charge with primer and igniter charge; a fuze with burster or expelling charge. The term includes grenades, smoke.

NOTE: SIGNALS, SMOKE are not included in this definition. They are listed separately.

AMMUNITION, TEAR-PRODUCING, with burster, expelling charge or propelling charge: UN Nos. 0018, 0019, 0301

Ammunition containing a tear-producing substance. It also contains one or more of the following: a pyrotechnic substance; a propelling charge with primer and igniter charge; a fuze with burster or expelling charge.

ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE (ARTICLES EEI): UN No. 0486

Articles containing only extremely insensitive detonating substances (EIDS) which demonstrate a negligible probability of accidental initiation or propagation under normal conditions of transport, and which have passed Test Series 7.

ARTICLES, PYROPHORIC: UN No. 0380

Articles which contain a pyrophoric substance (capable of spontaneous ignition when exposed to air) and an explosive substance or component. The term excludes articles containing white phosphorus.

ARTICLES, PYROTECHNIC, for technical purposes: UN Nos. 0428, 0429, 0430, 0431, 0432

Articles which contain pyrotechnic substances and are used for technical purposes such as heat generation, gas generation, theatrical effects, etc.

NOTE: The following articles: all ammunition; CARTRIDGES, SIGNAL; CUTTERS, CABLE, EXPLOSIVE; FIREWORKS; FLARES, AERIAL; FLARES, SURFACE; RELEASE DEVICES, EXPLOSIVE; RIVETS, EXPLOSIVE; SIGNAL DEVICES, HAND; SIGNALS,

DISTRESS; SIGNALS, RAILWAY TRACK, EXPLOSIVES; SIGNALS, SMOKE are not included in this definition. They are listed separately.

BLACK POWDER (GUNPOWDER), COMPRESSED or BLACK POWDER (GUNPOWDER), IN PELLETS: UN No. 0028

Substance consisting of a pelletized form of black powder.

BLACK POWDER (GUNPOWDER), granular or as meal: UN No. 0027

Substance consisting of an intimate mixture of charcoal or other carbon and either potassium nitrate or sodium nitrate, with or without sulphur.

BOMBS, WITH FLAMMABLE LIQUID, with bursting charge: UN Nos. 0399, 0400

Articles which are dropped from aircraft, consisting of a tank filled with inflammable liquid and bursting charge.

BOMBS, PHOTO-FLASH: UN No. 0038

Explosive articles which are dropped from aircraft to provide brief, intense illumination for photography. They contain a charge of detonating explosive without means of initiation or with means of initiation containing two or more effective protective features.

BOMBS, PHOTO-FLASH: UN No. 0037

Explosive articles which are dropped from aircraft to provide brief, intense illumination for photography. They contain a charge of detonating explosive with means of initiation not containing two or more effective protective features.

BOMBS, PHOTO-FLASH: UN Nos. 0039, 0299

Explosive articles which are dropped from aircraft to provide brief, intense illumination for photography. They contain a photo-flash composition.

BOMBS with bursting charge: UN Nos. 0034; 0035

Explosive articles which are dropped from aircraft, without means of initiation or with means of initiation containing two or more effective protective features.

BOMBS with bursting charge: UN Nos. 0033, 0291

Explosive articles which are dropped from aircraft, with means of initiation not containing two or more effective protective features.

BOOSTERS WITH DETONATOR: UN Nos. 0225, 0268

Articles consisting of a charge of detonating explosive with means of initiation. They are used to increase the initiating power of detonators or detonating cord.

BOOSTERS without detonator: UN Nos. 0042, 0283

Articles consisting of a charge of detonating explosive without means of initiation. They are used to increase the initiating power of detonators or detonating cord.

BURSTERS, explosive: UN No. 0043

Articles consisting of a small charge of explosive used to open projectiles or other ammunition in order to disperse their contents.

CARTRIDGES, FLASH: UN Nos. 0049, 0050

Articles consisting of a casing, a primer and flash powder, all assembled in one piece ready for firing.

CARTRIDGES FOR WEAPONS, BLANK: UN Nos. 0326, 0413, 0327, 0338, 0014

Ammunition consisting of a closed cartridge case with a centre or rim fire primer and a charge of smokeless or black powder but no projectile. It produces a loud noise and is used for training, saluting, propelling charge, starter pistols, etc. The term includes ammunition, blank.

CARTRIDGES FOR WEAPONS, INERT PROJECTILE: UN Nos. 0328, 0417, 0339, 0012

Ammunition consisting of a projectile without bursting charge but with a propelling charge with or without a primer. The articles may include a tracer, provided that the predominant hazard is that of the propelling charge.

CARTRIDGES FOR WEAPONS with bursting charge: UN Nos. 0006, 0321, 0412

Ammunition consisting of a projectile with a bursting charge without means of initiation or with means of initiation containing two or more effective protective features; and a propelling charge with or without a primer. The term includes fixed (assembled) ammunition, semi-fixed (partially assembled) ammunition and separate loading ammunition when the components are packed together.

CARTRIDGES FOR WEAPONS with bursting charge: UN Nos. 0005, 0007, 0348

Ammunition consisting of a projectile with a bursting charge with means of initiation not containing two or more effective protective features; and a propelling charge with or without a primer. The term includes fixed (assembled) ammunition, semi-fixed (partially assembled) ammunition and separate loading ammunition when the components are packed together.

CARTRIDGES, OIL WELL: UN Nos. 0277, 0278

Articles consisting of a thin casing of fibreboard, metal or other material containing only propellant powder which projects a hardened projectile to perforate an oil well casing.

NOTE: CHARGES, SHAPED are not included in this definition. They are listed separately.

CARTRIDGES, POWER DEVICE: UN Nos. 0275, 0276, 0323, 0381

Articles designed to accomplish mechanical actions. They consist of a casing with a charge of deflagrating explosive and a means of ignition. The gaseous products of the deflagration produce inflation, linear or rotary motion or activate diaphragms, valves or switches or project fastening devices or extinguishing agents.

CARTRIDGES, SIGNAL: UN Nos. 0054, 0312, 0405

Articles designed to fire coloured flares or other signals from signal pistols, etc.

CARTRIDGES, SMALL ARMS: UN Nos. 0417, 0339, 0012

Ammunition consisting of a cartridge case fitted with a centre or rim fire primer and containing both a propelling charge and solid projectile. They are designed to be fired in weapons of calibre not larger than 19.1 mm. Shot-gun cartridges of any calibre are included in this description.

NOTE: CARTRIDGES, SMALL ARMS, BLANK, are not included in this definition. They are listed separately. Some military small arms cartridges are not included in this definition. They are listed under CARTRIDGES FOR WEAPONS, INERT PROJECTILE.

CARTRIDGES, SMALL ARMS, BLANK: UN Nos. 0014, 0327, 0338

Ammunition consisting of a closed cartridge case with a centre or rim fire primer and a charge of smokeless or black powder. The cartridge cases contain no projectiles. The cartridges are designed to be fired from weapons with a calibre of at most 19.1 mm and serve to produce a loud noise and are used for training, saluting, propelling charge, starter pistols, etc.

CASES, CARTRIDGE, EMPTY, WITH PRIMER: UN Nos. 0379; 0055

Articles consisting of a cartridge case made from metal, plastics or other non-inflammable material, in which the only explosive component is the primer.

CASES, COMBUSTIBLE, EMPTY, WITHOUT PRIMER: UN Nos. 0447, 0446

Articles consisting of a cartridge case made partly or entirely from nitrocellulose.

CHARGES, BURSTING, PLASTICS BONDED: UN Nos. 0457, 0458, 0459, 0460

Articles consisting of a charge of detonating explosive, plastics bonded, manufactured in a specific form without a casing and without means of initiation. They are designed as components of ammunition such as warheads.

CHARGES, DEMOLITION: UN No. 0048

Articles containing a charge of a detonating explosive in a casing of fibreboard, plastics, metal or other material. The articles are without means of initiation or with means of initiation containing two or more effective protective features.

NOTE: The following articles: BOMBS; MINES; PROJECTILES are not included in this definition. They are listed separately.

CHARGES, DEPTH: UN No. 0056

Articles consisting of a charge of detonating explosive contained in a drum or projectile without means of initiation or with means of initiation containing two or more effective protective features. They are designed to detonate under water.

CHARGES, EXPLOSIVE, COMMERCIAL without detonator: UN Nos. 0442, 0443, 0444, 0445

Articles consisting of a charge of detonating explosive without means of initiation, used for explosive welding, jointing, forming and other metallurgical processes.

CHARGES, PROPELLING, FOR CANNON: UN Nos. 0242, 0279, 0414

Charges of propellant in any physical form for separate-loading ammunition for cannon.

CHARGES, PROPELLING: UN Nos. 0271, 0272, 0415, 0491

Articles consisting of a charge of a propellant charge in any physical form, with or without a casing, as a component of rocket motors or for reducing the drag of projectiles.

CHARGES, SHAPED, without detonator: UN Nos. 0059, 0439, 0440, UN 0441

Articles consisting of a casing containing a charge of detonating explosive with a cavity lined with rigid material, without means of initiation. They are designed to produce a powerful, penetrating jet effect.

CHARGES, SHAPED, FLEXIBLE, LINEAR: UN Nos. 0237, 0288

Articles consisting of a V-shaped core of a detonating explosive clad by a flexible sheath.

CHARGES, SUPPLEMENTARY, EXPLOSIVE: UN No. 0060

Articles consisting of a small removable booster placed in the cavity of a projectile between the fuze and the bursting charge.

COMPONENTS, EXPLOSIVE TRAIN, N.O.S.: UN Nos. 0382, 0383, 0384, 0461

Articles containing an explosive designed to transmit detonation or deflagration within an explosive train.

CONTRIVANCES, WATER-ACTIVATED with burster, expelling charge or propelling charge: UN Nos. 0248, 0249

Articles whose functioning depends upon physico-chemical reaction of their contents with water.

CORD, DETONATING, flexible: UN Nos. 0065, 0289

Article consisting of a core of detonating explosive enclosed in spun fabric and a plastics or other covering. The covering is not necessary if the spun fabric is sift-proof.

CORD (FUSE) DETONATING, metal clad: UN Nos. 0102, 0290

Article consisting of a core of detonating explosive clad by a soft metal tube with or without protective covering.

CORD (FUSE) DETONATING, MILD EFFECT, metal clad: UN No. 0104

Article consisting of a core of detonating explosive clad by a soft metal tube with or without a protective covering. The quantity of explosive substance is so small that only a mild effect is manifested outside the cord.

CORD, IGNITER: UN No. 0066

Article consisting of textile yarns covered with black powder or another fast burning pyrotechnic composition and of a flexible protective covering; or it consists of a core of

black powder surrounded by a flexible woven fabric. It burns progressively along its length with an external flame and is used to transmit ignition from a device to a charge or primer.

CUTTERS, CABLE, EXPLOSIVE: UN No. 0070

Articles consisting of a knife-edged device which is driven by a small charge of deflagrating explosive into an anvil.

DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting: UN Nos. 0360, 0361, 0500

Non-electric detonators assembled with and activated by such means as safety fuse, shock tube, flash tube or detonating cord. They may be of instantaneous design or incorporate delay elements. Detonating relays incorporating detonating cord are included.

DETONATORS, ELECTRIC for blasting: UN Nos. 0030, 0255, 0456

Articles specially designed for the initiation of blasting explosives. These detonators may be constructed to detonate instantaneously or may contain a delay element. Electric detonators are activated by an electric current.

DETONATORS FOR AMMUNITION: UN Nos. 0073, 0364, 0365, 0366

Articles consisting of a small metal or plastics tube containing explosives such as lead azide, PETN or combinations of explosives. They are designed to start a detonation train.

DETONATORS, NON-ELECTRIC for blasting: UN Nos. 0029, 0267, 0455

Articles specially designed for the initiation of blasting explosives. These detonators may be constructed to detonate instantaneously or may contain a delay element. Non-electric detonators are activated by such means as shock tube, flash tube, safety fuse, other igniferous device or flexible detonating cord. Detonating relays without detonating cord are included.

EXPLOSIVE, BLASTING, TYPE A: UN No. 0081

Substances consisting of liquid organic nitrates such as nitroglycerine or a mixture of such ingredients with one or more of the following: nitrocellulose; ammonium nitrate or other inorganic nitrates; aromatic nitro-derivatives, or combustible materials, such as wood-meal and aluminium powder. They may contain inert components such as kieselguhr, and additives such as colouring agents and stabilizers. Such explosives shall be in powdery, gelatinous or elastic form. The term includes dynamite; gelatine, blasting and gelatine dynamites.

EXPLOSIVE, BLASTING, TYPE B: UN Nos. 0082, 0331

Substances consisting of

- (a) a mixture of ammonium nitrate or other inorganic nitrates with an explosive such as trinitrotoluene, with or without other substances such as wood-meal and aluminium powder; or
- (b) a mixture of ammonium nitrate or other inorganic nitrates with other combustible substances which are not explosive ingredients. In both cases they may contain inert components such as kieselguhr, and additives such as colouring agents and stabilizers. Such explosives must not contain nitroglycerine, similar liquid organic nitrates or chlorates.

EXPLOSIVE, BLASTING, TYPE C: UN No. 0083

Substances consisting of a mixture of either potassium or sodium chlorate or potassium, sodium or ammonium perchlorate with organic nitro-derivatives or combustible materials such as wood-meal or aluminium powder or a hydrocarbon. They may contain inert components such as kieselguhr and additives such as colouring agents and stabilizers. Such explosives must not contain nitroglycerine or similar liquid organic nitrates.

EXPLOSIVE, BLASTING, TYPE D: UN No. 0084

Substances consisting of a mixture of organic nitrated compounds and combustible materials such as hydrocarbons and aluminium powder. They may contain inert components such as kieselguhr and additives such as colouring agents and stabilizers. Such explosives must not contain nitroglycerine, similar liquid organic nitrates, chlorates and ammonium nitrate. The term generally includes plastic explosives.

EXPLOSIVES, BLASTING, TYPE E: UN Nos. 0241, 0332

Substances consisting of water as an essential ingredient and high proportions of ammonium nitrate or other oxidizers, some or all of which are in solution. The other constituents may include nitro-derivatives such as trinitrotoluene, hydrocarbons or aluminium powder. They may contain inert components such as kieselguhr and additives such as colouring agents and stabilizers. The term includes explosives, emulsion, explosives, slurry and explosives, wattergel.

FIREWORKS: UN Nos. 0333, 0334, 0335, 0336, 0337

Pyrotechnic articles designed for entertainment.

FLARES, AERIAL: UN Nos. 0093, 0403, 0404, 0420, 0421;

Articles containing pyrotechnic substances which are designed to be dropped from an aircraft to illuminate, identify, signal or warn.

FLARES, SURFACE: UN Nos. 0092, 0418, 0419

Articles containing pyrotechnic substances which are designed for use on the surface to illuminate, identify, signal or warn.

FLASH POWDER: UN Nos. 0094, 0305

Pyrotechnic substance which, when ignited, produces an intense light.

FRACTURING DEVICES, EXPLOSIVE without detonator, for oil wells: UN No. 0099

Articles consisting of a charge of detonating explosive contained in a casing without means of initiation. They are used to fracture the rock around a drill shaft to assist the flow of crude oil from the rock.

FUSE, IGNITER, tubular, metal clad: UN No. 0103

Article consisting of a metal tube with a core of deflagrating explosive.

FUSE, NON-DETONATING: UN No. 0101

Article consisting of cotton yarns impregnated with fine black powder (quickmatch). It burns with an external flame and is used in ignition trains for fireworks, etc.

FUSE, SAFETY: UN No. 0105

Article consisting of a core of fine grained black powder surrounded by a flexible woven fabric with one or more protective outer coverings. When ignited, it burns at a predetermined rate without any external explosive effect.

FUZES, DETONATING: UN Nos. 0106, 0107, 0257, 0367

Articles with explosive components designed to produce a detonation in ammunition. They incorporate mechanical, electrical, chemical or hydrostatic components to initiate the detonation. They generally incorporate protective features.

FUZES, DETONATING with protective features: UN Nos. 0408, 0409, 0410

Articles with explosive components designed to produce a detonation in ammunition. They incorporate mechanical, electrical, chemical or hydrostatic components to initiate the detonation. The detonating fuze must incorporate two or more effective protective features.

FUZES, IGNITING: UN Nos. 0316, 0317, 0368

Articles with primary explosive components designed to produce a deflagration in ammunition. They incorporate mechanical, electrical, chemical or hydrostatic components to start the deflagration. They generally incorporate protective features.

GRENADES, hand or rifle, with bursting charge: UN Nos. 0284, 0285

Articles which are designed to be thrown by hand or to be projected by a rifle. They are without means of initiation or with means of initiation containing two or more effective protective features.

GRENADES, hand or rifle, with bursting charge: UN Nos. 0292, 0293

Articles which are designed to be thrown by hand or to be projected by a rifle. They are with means of initiation not containing two or more effective protective features.

GRENADES, PRACTICE, hand or rifle: UN Nos. 0110, 0372, 0318, 0452

Articles without a main bursting charge which are designed to be thrown by hand or to be projected by a rifle. They contain the priming device and may contain a spotting charge.

HEXOTONAL: UN No. 0393

Substance consisting of an intimate mixture of cyclotrimethylenetrinitramine (RDX), trinitrotoluene (TNT) and aluminium.

HEXOLITE (HEXOTOL), dry or wetted with less than 15 % water, by mass: UN No. 0118

Substance consisting of an intimate mixture of cyclotrimethylenetrinitramine (RDX) and trinitrotoluene (TNT). The term includes "Composition B".

IGNITERS: UN Nos. 0121, 0314, 0315, 0325, 0454

Articles containing one or more explosive substances designed to produce a deflagration in an explosive train. They may be actuated chemically, electrically or mechanically.

NOTE: The following articles: CORD, IGNITER; FUSE, IGNITER; FUSE, NON-DETONATING; FUZES, IGNITING; LIGHTERS, FUSE; PRIMERS, CAP TYPE; PRIMERS, TUBULAR are not included in this definition. They are listed separately.

JET PERFORATING GUNS, CHARGED, oil well, without detonator: UN Nos. 0124, 0494

Articles consisting of a steel tube or metallic strip, into which are inserted shaped charges connected by detonating cord, without means of initiation.

LIGHTERS, FUSE: UN No. 0131

Articles of various design actuated by friction, percussion or electricity and used to ignite safety fuse.

MINES with bursting charge: UN Nos. 0137, 0138

Articles consisting normally of metal or composition receptacles filled with a detonating explosive, without means of initiation or with means of initiation containing two or more effective protective features. They are designed to be operated by the passage of ships, vehicles or personnel. The term includes "Bangalore torpedoes".

MINES with bursting charge: UN Nos. 0136, 0294

Articles consisting normally of metal or composition receptacles filled with a detonating explosive, with means of initiation not containing two or more effective protective features. They are designed to be operated by the passage of ships, vehicles or personnel. The term includes "Bangalore torpedoes".

OCTOLITE (OCTOL), dry or wetted with less than 15 % water, by mass: UN No. 0266

Substance consisting of an intimate mixture of cyclotetramethylenetetranitramine (HMX) and trinitrotoluene (TNT).

OCTONAL: UN No. 0496

Substance consisting of an intimate mixture of cyclotetramethylenetetranitramine (HMX), trinitrotoluene (TNT) and aluminium.

PENTOLITE, dry or wetted with less than 15 % water, by mass: UN No. 0151

Substance consisting of an intimate mixture of pentaerythrite tetranitrate (PETN) and trinitrotoluene (TNT).

POWDER CAKE (POWDER PASTE), WETTED with not less than 17 % alcohol, by mass; POWDER CAKE (POWDER PASTE), WETTED with not less than 25 % water, by mass: UN Nos. 0433, 0159

Substance consisting of nitrocellulose impregnated with not more than 60 % of nitroglycerine or other liquid organic nitrates or a mixture of these.

POWDER, SMOKELESS: UN Nos. 0160, 0161

Substance based on nitrocellulose used as propellant. The term includes propellants with a single base (nitrocellulose (NC) alone), those with a double base (such as NC and nitroglycerine (NG)) and those with a triple base (such as NC/NG/nitroguanidine).

NOTE: Cast, pressed or bag-charges of smokeless powder are listed under CHARGES, PROPELLING or CHARGES, PROPELLING, FOR CANON.

PRIMERS, CAP TYPE: UN Nos. 0044, 0377, 0378

Articles consisting of a metal or plastics cap containing a small amount of primary explosive mixture that is readily ignited by impact. They serve as igniting elements in small arms cartridges and in percussion primers for propelling charges.

PRIMERS, TUBULAR: UN Nos. 0319, 0320, 0376

Articles consisting of a primer for ignition and an auxiliary charge of deflagrating explosive such as black powder used to ignite the propelling charge in a cartridge case for cannon, etc.

PROJECTILES, inert with tracer: UN Nos. 0345, 0424, 0425

Articles such as a shell or bullet, which are projected from a cannon or other gun, rifle or other small arm.

PROJECTILES with burster or expelling charge: UN Nos. 0346, 0347

Articles such as a shell or bullet, which are projected from a cannon or other gun. They are without means of initiation or with means of initiation containing two or more effective protective features. They are used to scatter dyes for spotting or other inert materials.

PROJECTILES with burster or expelling charge: UN Nos. 0426, 0427

Articles such as a shell or bullet, which are projected from a cannon or other gun. They are with means of initiation not containing two or more effective protective features. They are used to scatter dyes for spotting or other inert materials.

PROJECTILES with burster or expelling charge: UN Nos. 0434, 0435

Articles such as a shell or bullet, which are projected from a cannon or other gun, rifle or other small arm. They are used to scatter dyes for spotting or other inert materials.

PROJECTILES with bursting charge: UN Nos. 0168, 0169, 0344

Articles such as a shell or bullet, which are projected from a cannon or other gun. They are without means of initiation or with means of initiation containing two or more effective protective features.

PROJECTILES with bursting charge: UN Nos. 0167, 0324

Articles such as a shell or bullet, which are projected from a cannon or other gun. They are with means of initiation not containing two or more effective protective features.

PROPELLANT, LIQUID: UN Nos. 0495, 0497

Substance consisting of a deflagrating liquid explosive, used for propulsion.

PROPELLANT, SOLID: UN Nos. 0498, 0499, 0501

Substance consisting of a deflagrating solid explosive, used for propulsion.

RELEASE DEVICES, EXPLOSIVE: UN No. 0173

Articles consisting of a small charge of explosive with means of initiation and rods or links. They sever the rods or links to release equipment quickly.

RIVETS, EXPLOSIVE: UN No. 0174

Articles consisting of a small charge of explosive inside a metallic rivet.

ROCKET MOTORS: UN Nos. 0186, 0280, 0281

Articles consisting of a charge of explosive, generally a solid propellant, contained in a cylinder fitted with one or more nozzles. They are designed to propel a rocket or a guided missile.

ROCKET MOTORS, LIQUID FUELLED: UN Nos. 0395, 0396

Articles consisting of a liquid fuel within a cylinder fitted with one or more nozzles. They are designed to propel a rocket or a guided missile.

ROCKET MOTORS WITH HYPERGOLIC LIQUIDS with or without expelling charge: UN Nos. 0322, 0250

Articles consisting of a hypergolic fuel contained in a cylinder fitted with one or more nozzles. They are designed to propel a rocket or a guided missile.

ROCKETS, LINE THROWING: UN Nos. 0238, 0240, 0453

Articles consisting of a rocket motor which is designed to extend a line.

ROCKETS, LIQUID FUELLED with bursting charge: UN Nos. 0397, 0398

Articles consisting of a liquid fuel within a cylinder fitted with one or more nozzles and fitted with a warhead. The term includes guided missiles.

ROCKETS with bursting charge: UN Nos. 0181, 0182

Articles consisting of a rocket motor and a warhead without means of initiation or with means of initiation containing two or more effective protective features. The term includes guided missiles.

ROCKETS with bursting charge: UN Nos. 0180, 0295

Articles consisting of a rocket motor and a warhead with means of initiation not containing two or more effective protective features. The term includes guided missiles.

ROCKETS with expelling charge: UN Nos. 0436, 0437, 0438

Articles consisting of a rocket motor and a charge to expel the payload from a rocket head. The term includes guided missiles.

ROCKETS with inert head: UN Nos. 0183, 0502

Articles consisting of a rocket motor and an inert head. The term includes guided missiles.

SAMPLES, EXPLOSIVE, other than initiating explosive UN No. 0190

New or existing explosive substances or articles, not yet assigned to a name in Table A of Chapter 3.2 and carried in conformity with the instructions of the competent authority and generally in small quantities, *inter alia*, for the purposes of testing, classification, research and development, or quality control, or as commercial samples.

NOTE: Explosive substances or articles already assigned to another name in Table A of Chapter 3.2 are not included in this definition.

SIGNAL DEVICES, HAND: UN Nos. 0191, 0373

Portable articles containing pyrotechnic substances which produce visual signals or warnings. The term includes small surface flares such as highway or railway flares and small distress flares.

SIGNALS, DISTRESS, ship: UN Nos. 0194, 0195, 0505, 0506

Articles containing pyrotechnic substances designed to produce signals by means of sound, flame or smoke or any combination thereof.

SIGNALS, RAILWAY TRACK, EXPLOSIVE: UN Nos. 0192, 0193, 0492, 0493

Articles containing a pyrotechnic substance which explodes with a loud report when the article is crushed. They are designed to be placed on a rail.

SIGNALS, SMOKE: UN Nos. 0196, 0197, 0313, 0487, 0507

Articles containing pyrotechnic substances which emit smoke. In addition they may contain devices for emitting audible signals.

SOUNDING DEVICES, EXPLOSIVE: UN Nos. 0374, 0375

Articles consisting of a charge of detonating explosive, without means of initiation or with means of initiation containing two or more effective protective features. They are dropped from ships and function when they reach a predetermined depth or the sea bed.

SOUNDING DEVICES, EXPLOSIVE: UN Nos. 0204, 0296

Articles consisting of a charge of detonating explosive with means of initiation not containing two or more effective protective features. They are dropped from ships and function when they reach a predetermined depth or the sea bed.

SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE (Substances, EVI), N.O.S.: UN No. 0482

Substances presenting a mass explosion hazard but which are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport, and which have passed Test Series 5.

TORPEDOES, LIQUID FUELLED with inert head: UN No. 0450

Articles consisting of a liquid explosive system to propel the torpedo through the water, with an inert head.

TORPEDOES, LIQUID FUELLED with or without bursting charge: UN No. 0449

Articles consisting of either a liquid explosive system to propel the torpedo through the water, with or without a warhead; or a liquid non-explosive system to propel the torpedo through the water, with a warhead.

TORPEDOES with bursting charge: UN No. 0451

Articles consisting of a non-explosive system to propel the torpedo through the water, and a warhead without means of initiation or with means of initiation containing two or more effective protective features.

TORPEDOES with bursting charge: UN No. 0329

Articles consisting of an explosive system to propel the torpedo through the water, and a warhead without means of initiation or with means of initiation containing two or more effective protective features.

TORPEDOES with bursting charge: UN No. 0330

Articles consisting of an explosive or non-explosive system to propel the torpedo through the water, and a warhead with means of initiation not containing two or more effective protective features.

TRACERS FOR AMMUNITION: UN Nos. 0212, 0306

Sealed articles containing pyrotechnic substances, designed to reveal the trajectory of a projectile.

TRITONAL: UN No. 0390

Substance consisting of trinitrotoluene (TNT) mixed with aluminium.

WARHEADS, ROCKET with burster or expelling charge: UN No. 0370

Articles consisting of an inert payload and a small charge of detonating or deflagrating explosive, without means of initiation or with means of initiation containing two or more effective protective features. They are designed to be fitted to a rocket motor to scatter inert material. The term includes warheads for guided missiles.

WARHEADS, ROCKET with burster or expelling charge: UN No. 0371

Articles consisting of an inert payload and a small charge of detonating or deflagrating explosive, with means of initiation not containing two or more effective protective features. They are designed to be fitted to a rocket motor to scatter inert material. The term includes warheads for guided missiles.

WARHEADS, ROCKET with bursting charge: UN Nos. 0286, 0287

Articles consisting of a detonating explosive, without means of initiation or with means of initiation containing two or more effective protective features. They are designed to be fitted to a rocket. The term includes warheads for guided missiles.

WARHEADS, ROCKET with bursting charge: UN No. 0369

Articles consisting of a detonating explosive, with means of initiation not containing two or more effective protective features. They are designed to be fitted to a rocket. The term includes warheads for guided missiles.

WARHEADS, TORPEDO with bursting charge: UN No. 0221

Articles consisting of a detonating explosive, without means of initiation or with means of initiation containing two or more effective protective features. They are designed to be fitted to a torpedo.

2.2.1.2 *Substances and articles not accepted for carriage*

- 2.2.1.2.1 Explosive substances which are unduly sensitive according to the criteria of the Manual of Tests and Criteria, Part I, or are liable to spontaneous reaction, as well as explosive substances and articles which cannot be assigned to a name or n.o.s. entry listed in Table A of Chapter 3.2, shall not be accepted for carriage.
- 2.2.1.2.2 Articles of compatibility group K shall not be accepted for carriage (1.2K, UN No. 0020 and 1.3K, UN No. 0021).

2.2.1.3 *List of collective entries*

Classification code (see 2.2.1.1.4)	UN No	Name of the substance or article
1.1A	0473	SUBSTANCES, EXPLOSIVE, N.O.S.
1.1B	0461	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.
1.1C	0474 0497 0498 0462	SUBSTANCES, EXPLOSIVE, N.O.S. PROPELLANT, LIQUID PROPELLANT, SOLID ARTICLES, EXPLOSIVE, N.O.S.
1.1D	0475 0463	SUBSTANCES, EXPLOSIVE, N.O.S. ARTICLES, EXPLOSIVE, N.O.S.
1.1E	0464	ARTICLES, EXPLOSIVE, N.O.S.
1.1F	0465	ARTICLES, EXPLOSIVE, N.O.S.
1.1G	0476	SUBSTANCES, EXPLOSIVE, N.O.S.
1.1L	0357 0354	SUBSTANCES, EXPLOSIVE, N.O.S. ARTICLES, EXPLOSIVE, N.O.S.
1.2B	0382	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.
1.2C	0466	ARTICLES, EXPLOSIVE, N.O.S.
1.2D	0467	ARTICLES, EXPLOSIVE, N.O.S.
1.2E	0468	ARTICLES, EXPLOSIVE, N.O.S.
1.2F	0469	ARTICLES, EXPLOSIVE, N.O.S.
1.2L	0358 0248 0355	SUBSTANCES, EXPLOSIVE, N.O.S. CONTRIVANCES, WATER-ACTIVATED with burster, expelling charge or propelling charge ARTICLES, EXPLOSIVE, N.O.S.
1.3C	0132 0477 0495 0499 0470	DEFLAGRATING METAL SALTS OF AROMATIC NITRO- DERIVATIVES, N.O.S. SUBSTANCES, EXPLOSIVE, N.O.S. PROPELLANT, LIQUID PROPELLANT, SOLID ARTICLES, EXPLOSIVE, N.O.S.
1.3G	0478	SUBSTANCES, EXPLOSIVE, N.O.S.
1.3L	0359 0249 0356	SUBSTANCES, EXPLOSIVE, N.O.S. CONTRIVANCES, WATER-ACTIVATED with burster, expelling charge or propelling charge ARTICLES, EXPLOSIVE, N.O.S.
1.4B	0350 0383	ARTICLES, EXPLOSIVE, N.O.S. COMPONENTS, EXPLOSIVE TRAIN, N.O.S.
1.4C	0479 0351 0501	SUBSTANCES, EXPLOSIVE, N.O.S. ARTICLES, EXPLOSIVE, N.O.S. PROPELLANT, SOLID
1.4D	0480 0352	SUBSTANCES, EXPLOSIVE, N.O.S. ARTICLES, EXPLOSIVE, N.O.S.
1.4E	0471	ARTICLES, EXPLOSIVE, N.O.S.
1.4F	0472	ARTICLES, EXPLOSIVE, N.O.S.
1.4G	0485 0353	SUBSTANCES, EXPLOSIVE, N.O.S. ARTICLES, EXPLOSIVE, N.O.S.
1.4S	0481 0349 0384	SUBSTANCES, EXPLOSIVE, N.O.S. ARTICLES, EXPLOSIVE, N.O.S. COMPONENTS, EXPLOSIVE TRAIN, N.O.S.
1.5D	0482	SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE (SUBSTANCES, EVI) N.O.S.

Classification code (see 2.2.1.1.4)	UN No	Name of the substance or article
1.6N	0486	ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE (ARTICLES, EEI)
	0190	SAMPLES, EXPLOSIVE other than initiating explosive <i>NOTE: Division and Compatibility Group shall be defined as directed by the competent authority and according to the principles in 2.2.1.1.4.</i>

2.2.2 Class 2 Gases**2.2.2.1 Criteria**

2.2.2.1.1 The heading of Class 2 covers pure gases, mixtures of gases, mixtures of one or more gases with one or more other substances and articles containing such substances.

A gas is a substance which:

- (a) at 50 °C has a vapour pressure greater than 300 kPa (3 bar); or
- (b) is completely gaseous at 20° C at the standard pressure of 101.3 kPa .

NOTE 1: *UN No. 1052 HYDROGEN FLUORIDE, ANHYDROUS is nevertheless classified in Class 8.*

NOTE 2: *A pure gas may contain other components deriving from its production process or added to preserve the stability of the product, provided that the level of these components does not change its classification or its conditions of carriage, such as filling ratio, filling pressure, test pressure.*

NOTE 3: *N.O.S. entries in 2.2.2.3 may cover pure gases as well as mixtures.*

NOTE 4: *Carbonated beverages are not subject to the provisions of ADN.*

2.2.2.1.2 The substances and articles of Class 2 are subdivided as follows:

1. *Compressed gas:* a gas which when packaged under pressure for carriage is entirely gaseous at -50 °C; this category includes all gases with a critical temperature less than or equal to -50 °C;
2. *Liquefied gas:* a gas which when packaged under pressure for carriage is partially liquid at temperatures above -50 °C. A distinction is made between:

High pressure liquefied gas: a gas with a critical temperature above -50 °C and equal to or below +65 °C; and

Low pressure liquefied gas: a gas with a critical temperature above +65 °C;

3. *Refrigerated liquefied gas:* a gas which when packaged for carriage is made partially liquid because of its low temperature;
4. *Dissolved gas:* a gas which when packaged under pressure for carriage is dissolved in a liquid phase solvent;
5. Aerosol dispensers and receptacles, small, containing gas (gas cartridges);
6. Other articles containing gas under pressure;
7. Non-pressurized gases subject to special requirements (gas samples).

2.2.2.1.3 Substances and articles (except aerosols) of Class 2 are assigned to one of the following groups according to their hazardous properties, as follows:

A asphyxiant;

O	oxidizing;
F	flammable;
T	toxic;
TF	toxic, flammable;
TC	toxic, corrosive;
TO	toxic, oxidizing;
TFC	toxic, flammable, corrosive;
TOC	toxic, oxidizing, corrosive.

For gases and gas mixtures presenting hazardous properties associated with more than one group according to the criteria, the groups designated by letter T take precedence over all other groups. The groups designated by letter F take precedence over the groups designated by letters A or O.

NOTE 1: *In the UN Model Regulations, the IMDG Code and the ICAO Technical Instructions, gases are assigned to one of the following three divisions, based on the primary hazard:*

Division 2.1: flammable gases (corresponding to the groups designated by the capital letter F);

Division 2.2: non-flammable, non-toxic gases (corresponding to the groups designated by the capital letters A or O);

Division 2.3: toxic gases (corresponding to the groups designated by the capital letter T (i.e. T, TF, TC, TO, TFC and TOC)).

NOTE 2: *Receptacles, small containing gas (UN No. 2037) shall be assigned to the groups A to TOC according to the hazard of the contents. For aerosols (UN No. 1950), see 2.2.2.1.6.*

NOTE 3: *Corrosive gases are considered to be toxic, and are therefore assigned to the group TC, TFC or TOC.*

NOTE 4: *Mixtures containing more than 21% oxygen by volume shall be classified as oxidizing.*

2.2.2.1.4 If a mixture of Class 2 mentioned by name in Table A of Chapter 3.2 meets different criteria as mentioned in 2.2.2.1.2 and 2.2.2.1.5, this mixture shall be classified according to the criteria and assigned to an appropriate N.O.S. entry.

2.2.2.1.5 Substances and articles (except aerosols) of Class 2 which are not mentioned by name in Table A of Chapter 3.2 shall be classified under a collective entry listed in 2.2.2.3 in accordance with 2.2.2.1.2 and 2.2.2.1.3. The following criteria shall apply:

Asphyxiant gases

Gases which are non-oxidizing, non-flammable and non-toxic and which dilute or replace oxygen normally in the atmosphere.

Flammable gases

Gases which at 20 °C and a standard pressure of 101.3 kPa:

- (a) are ignitable when in a mixture of 13% or less by volume with air; or
- (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit.

Flammability shall be determined by tests or by calculation, in accordance with methods adopted by ISO (see ISO 10156:1996).

Where insufficient data are available to use these methods, tests by a comparable method recognized by the competent authority of the country of origin may be used.

If the country of origin is not a Contracting Party to ADN these methods shall be recognized by the competent authority of the first country Contracting Party to ADN reached by the consignment.

Oxidizing gases

Gases, which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. Oxidizing ability is determined either by tests or by calculation methods adopted by ISO (see ISO 10156:1996 and ISO 10156-2:2005).

Toxic gases

NOTE: Gases meeting the criteria for toxicity in part or completely owing to their corrosivity are to be classified as toxic. See also the criteria under the heading "Corrosive gases" for a possible subsidiary corrosivity risk.

Gases which:

- (a) are known to be so toxic or corrosive to humans as to pose a hazard to health; or
- (b) are presumed to be toxic or corrosive to humans because they have a LC₅₀ value for acute toxicity equal to or less than 5 000 ml/m³ (ppm) when tested in accordance with 2.2.61.1.

In the case of gas mixtures (including vapours of substances from other classes) the following formula may be used:

$$LC_{50} \text{ Toxic (mixture)} = \frac{I}{\sum_{i=1}^n \frac{f_i}{T_i}}$$

where f_i = mole fraction of the i^{th} component substance of the mixture;

T_i = toxicity index of the i^{th} component substance of the mixture.
The T_i equals the LC₅₀ value as found in packing instruction P200 of 4.1.4.1 of ADR.
When no LC₅₀ value is listed in packing instruction P200 of 4.1.4.1 of ADR, a LC₅₀ value available in scientific literature shall be used.

When the LC₅₀ value is unknown, the toxicity index is determined by using the lowest LC₅₀ value of substances of similar physiological and chemical effects, or through testing if this is the only practical possibility.

Corrosive gases

Gases or gas mixtures meeting the criteria for toxicity completely owing to their corrosivity are to be classified as toxic with a subsidiary corrosivity risk.

A gas mixture that is considered to be toxic due to the combined effects of corrosivity and toxicity has a subsidiary risk of corrosivity when the mixture is known by human experience to be destructive to the skin, eyes or mucous membranes or when the LC₅₀ value of the corrosive components of the mixture is equal to or less than 5 000 ml/m³ (ppm) when the LC₅₀ is calculated by the formula:

$$LC_{50} \text{ Corrosive (mixture)} = \frac{1}{\sum_{i=1}^n \frac{f_{ci}}{T_{ci}}}$$

where f_{ci} = mole fraction of the i^{th} corrosive component substance of the mixture;

T_{ci} = toxicity index of the i^{th} corrosive component substance of the mixture.

The T_{ci} equals the LC₅₀ value as found in packing instruction P200 of 4.1.4.1 of ADR.

When no LC₅₀ value is listed in packing instruction P200 of 4.1.4.1 of ADR, a LC₅₀ value available in scientific literature shall be used. When the LC₅₀ value is unknown the toxicity index is determined by using the lowest LC₅₀ value of substances of similar physiological and chemical effects, or through testing if this is the only practical possibility.

2.2.2.1.6 *Aerosols*

Aerosols (UN No. 1950) are assigned to one of the following groups according to their hazardous properties, as follows:

- A asphyxiant;
- O oxidizing;
- F flammable;
- T toxic;
- C corrosive;
- CO corrosive, oxidizing;
- FC flammable, corrosive;
- TF toxic, flammable;

TC	toxic, corrosive;
TO	toxic, oxidizing;
TFC	toxic, flammable, corrosive
TOC	toxic, oxidizing, corrosive.

The classification depends on the nature of the contents of the aerosol dispenser.

NOTE: *Gases, which meet the definition of toxic gases according to 2.2.2.1.5 or of pyrophoric gases according to packing instruction P200 in 4.1.4.1 of ADR, shall not be used as a propellant in an aerosol dispenser. Aerosols with contents meeting the criteria for packing group I for toxicity or corrosivity shall not be accepted for carriage (see also 2.2.2.2.2).*

The following criteria shall apply:

- (a) Assignment to group A shall apply when the contents do not meet the criteria for any other group according to sub-paragraphs (b) to (f) below;
- (b) Assignment to group O shall apply when the aerosol contains an oxidizing gas according to 2.2.2.1.5;
- (c) Assignment to group F shall apply if the contents include 85% by mass or more flammable components and the chemical heat of combustion is 30 kJ/g or more.

It shall not apply if the contents contain 1% by mass or less flammable components and the heat of combustion is less than 20 kJ/g.

Otherwise the aerosol shall be tested for flammability in accordance with the tests described in the *Manual of Tests and Criteria*, Part III, section 31. Extremely flammable and flammable aerosols shall be assigned to group F;

NOTE: *Flammable components are flammable liquids, flammable solids or flammable gases and gas mixtures as defined in Notes 1 to 3 of sub-section 31.1.3 of Part III of the Manual of Tests and Criteria. This designation does not cover pyrophoric, self-heating or water-reactive substances. The chemical heat of combustion shall be determined by one of the following methods ASTM D 240, ISO/FDIS 13943: 1999 (E/F) 86.1 to 86.3 or NFPA 30B.*

- (d) Assignment to group T shall apply when the contents, other than the propellant of aerosol dispensers to be ejected, are classified as Class 6.1, packing groups II or III;
- (e) Assignment to group C shall apply when the contents, other than the propellant of aerosol dispensers to be ejected, meet the criteria for Class 8, packing groups II or III;
- (f) When the criteria for more than one group amongst groups O, F, T, and C are met, assignment to groups CO, FC, TF, TC TO, TFC or TOC shall apply, as relevant.

2.2.2.2 Gases not accepted for carriage

- 2.2.2.2.1 Chemically unstable substances of Class 2 shall not be accepted for carriage, unless the necessary steps have been taken to prevent all possibility of a dangerous reaction e.g. decomposition, dismutation or polymerisation under normal conditions during transport.

To this end particular care shall be taken to ensure that receptacles and tanks do not contain any substances liable to promote these reactions.

2.2.2.2.2

The following substances and mixtures shall not be accepted for carriage:

- UN No. 2186 HYDROGEN CHLORIDE, REFRIGERATED LIQUID;
- UN No. 2421 NITROGEN TRIOXIDE;
- UN No. 2455 METHYL NITRITE;
- Refrigerated liquefied gases which cannot be assigned to classification codes 3A, 3O or 3F;
- Dissolved gases which cannot be classified under UN Nos. 1001, 2073 or 3318;
- Aerosols where gases which are toxic according to 2.2.2.1.5 or pyrophoric according to packing instruction P200 in 4.1.4.1 of ADR are used as propellants;
- Aerosols with contents meeting the criteria for packing group I for toxicity or corrosivity (see 2.2.61 and 2.2.8);
- Receptacles, small, containing gases which are very toxic (LC_{50} lower than 200 ppm) or pyrophoric according to packing instruction P200 in 4.1.4.1 of ADR.

2.2.2.3 List of collective entries

Compressed gases		
Classification code	UN No	Name and description
1 A	1956	COMPRESSED GAS, N.O.S.
1 O	3156	COMPRESSED GAS, OXIDIZING, N.O.S.
1 F	1964	HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S.
	1954	COMPRESSED GAS, FLAMMABLE, N.O.S.
1T	1955	COMPRESSED GAS, TOXIC, N.O.S.
1 TF	1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.
1 TC	3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.
1 TO	3303	COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S.
1 TFC	3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.
1 TOC	3306	COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.

Liquefied gases		
Classification code	UN No	Name and description
2 A	1058	LIQUEFIED GASES, non-flammable, charged with nitrogen, carbon dioxide or air
	1078	REFRIGERANT GAS, N.O.S. such as mixtures of gases, indicated by the letter R, which as: Mixture F1, have a vapour pressure at 70 °C not exceeding 1.3 MPa (13 bar) and a density at 50 °C not lower than that of dichlorofluoromethane (1.30 kg/l); Mixture F2, have a vapour pressure at 70 °C not exceeding 1.9 MPa (19 bar) and a density at 50 °C not lower than that of dichlorodifluoromethane (1.21 kg/l); Mixture F3, have a vapour pressure at 70 °C not exceeding 3 MPa (30 bar) and a density at 50 °C not lower than that of chlorodifluoromethane (1.09 kg/l). <i>NOTE: Trichlorofluoromethane (Refrigerant R 11), 1,1,2-trichloro-1,2,2-trifluoroethane (Refrigerant R 113), 1,1,1-trichloro-2,2,2-trifluoroethane (Refrigerant R 113a), 1-chloro-1,2,2-trifluoroethane (Refrigerant R 133) and 1-chloro-1,1,2-trifluoroethane (Refrigerant R 133b) are not substances of Class 2. They may, however, enter into the composition of mixtures F1 to F3.</i>
	1968	INSECTICIDE GAS, N.O.S.
	3163	LIQUEFIED GAS, N.O.S.
2 O	3157	LIQUEFIED GAS, OXIDIZING, N.O.S.

Liquefied gases (cont'd)		
Classification code	UN No	Name and description
2 F	1010	BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED, having a vapour pressure at 70 °C not exceeding 1.1 MPa (11 bar) and a density at 50 °C not lower than 0.525 kg/l. <i>NOTE: Butadienes, stabilized are also classified under UN No. 1010, see Table A of Chapter 3.2.</i>
	1060	METHYLACETYLENE AND PROPADIENE MIXTURE, STABILIZED such as mixtures of methylacetylene and propadiene with hydrocarbons, which as: Mixture P1, contain not more than 63% methylacetylene and propadiene by volume and not more than 24% propane and propylene by volume, the percentage of C ₄ - saturated hydrocarbons being not less than 14% by volume; and as Mixture P2, contain not more than 48% methylacetylene and propadiene by volume and not more than 50% propane and propylene by volume, the percentage of C ₄ - saturated hydrocarbons being not less than 5% by volume, as well as mixtures of propadiene with 1 to 4% methylacetylene.
	1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S such as mixtures, which as: Mixture A, have a vapour pressure at 70 °C not exceeding 1.1 MPa (11 bar) and a density at 50 °C not lower than 0.525 kg/l; Mixture A01, have a vapour pressure at 70 °C not exceeding 1.6 MPa (16 bar) and a relative density at 50 °C not lower than 0.516 kg/l; Mixture A02, have a vapour pressure at 70 °C not exceeding 1.6 MPa (16 bar) and a relative density at 50 °C not lower than 0.505 kg/l; Mixture A0, have a vapour pressure at 70 °C not exceeding 1.6 MPa (16 bar) and a density at 50 °C not lower than 0.495 kg/l; Mixture A1, have a vapour pressure at 70 °C not exceeding 2.1 MPa (21 bar) and a density at 50 °C not lower than 0.485 kg/l; Mixture B1 have a vapour pressure at 70 °C not exceeding 2.6 MPa (26 bar) and a relative density at 50 °C not lower than 0.474 kg/l; Mixture B2 have a vapour pressure at 70 °C not exceeding 2.6 MPa (26 bar) and a relative density at 50 °C not lower than 0.463 kg/l; Mixture B, have a vapour pressure at 70 °C not exceeding 2.6 MPa (26 bar) and a density at 50 °C not lower than 0.450 kg/l; Mixture C, have a vapour pressure at 70 °C not exceeding 3.1 MPa (31 bar) and a relative density at 50 °C not lower than 0.440 kg/l; <i>NOTE 1: In the case of the foregoing mixtures, the use of the following names customary in the trade is permitted for describing these substances: for mixture A01, A02 and A0: BUTANE; for mixture C: PROPANE.</i> <i>NOTE 2: UN No. 1075 PETROLEUM GASES, LIQUEFIED may be used as an alternative entry for UN No. 1965 HYDROCARBON GAS MIXTURE LIQUEFIED, N.O.S. for carriage prior to or following maritime or air carriage.</i>
	3354	INSECTICIDE GAS, FLAMMABLE, N.O.S.
	3161	LIQUEFIED GAS, FLAMMABLE, N.O.S.

Liquefied gases (cont'd)		
Classification code	UN No	Name and description
2 T	1967	INSECTICIDE GAS, TOXIC, N.O.S.
	3162	LIQUEFIED GAS, TOXIC, N.O.S.
2 TF	3355	INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.
	3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.
2 TC	3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.
2 TO	3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.
2 TFC	3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.
2 TOC	3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.

Refrigerated liquefied gases		
Classification code	UN No	Name and description
3 A	3158	GAS, REFRIGERATED LIQUID, N.O.S.
3 O	3311	GAS, REFRIGERATED LIQUID, OXIDIZING, N.O.S.
3 F	3312	GAS, REFRIGERATED LIQUID, FLAMMABLE, N.O.S.

Dissolved gases		
Classification code	UN No	Name and description
4		Only substances listed in Table A of Chapter 3.2 are to be accepted for carriage.

Aerosols and receptacles, small, containing gas		
Classification code	UN No	Name and description
5	1950	AEROSOLS
	2037	RECEPTACLES, SMALL CONTAINING GAS (GAS CARTRIDGES) without a release device, non-refillable

Other articles containing gas under pressure		
Classification code	UN No	Name and description
6A	2857	REFRIGERATING MACHINES containing non-flammable, non-toxic gases or ammonia solutions (UN 2672)
	3164	ARTICLES, PRESSURIZED, PNEUMATIC (containing non-flammable gas) or
	3164	ARTICLES, PRESSURIZED, HYDRAULIC (containing non-flammable gas)
6F	3150	DEVICES, SMALL, HYDROCARBON GAS POWERED or
	3150	HYDROCARBON GAS REFILLS FOR SMALL DEVICES, with release device
	3478	FUEL CELL CARTRIDGES, containing liquefied flammable gas or
	3478	FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT, containing liquefied flammable gas or
	3478	FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing liquefied flammable gas
	3479	FUEL CELL CARTRIDGES, containing hydrogen in metal hydride or
	3479	FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT, containing hydrogen in metal hydride or
3479	FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing hydrogen in metal hydride	

Gas samples		
Classification code	UN No	Name and description
7 F	3167	GAS SAMPLE, NON-PRESSURIZED, FLAMMABLE, N.O.S., not refrigerated liquid
7 T	3169	GAS SAMPLE, NON-PRESSURIZED, TOXIC, N.O.S., not refrigerated liquid
7 TF	3168	GAS SAMPLE, NON-PRESSURIZED, TOXIC, FLAMMABLE, N.O.S., not refrigerated liquid

2.2.3 Class 3 Flammable liquids**2.2.3.1 Criteria**

2.2.3.1.1 The heading of Class 3 covers substances and articles containing substances of this Class which:

- are liquids according to subparagraph (a) of the definition for "liquid" in 1.2.1;
- have at 50 °C a vapour pressure of not more than 300 kPa (3 bar) and are not completely gaseous at 20 °C and at standard pressure of 101.3 kPa; and
- have a flash-point of not more than 60 °C (see 2.3.3.1 for the relevant test).

The heading of Class 3 also covers liquid substances and molten solid substances with a flash-point of more than 60°C and which are carried or handed over for carriage whilst heated at temperatures equal to or higher than their flash-point. These substances are assigned to UN No. 3256.

The heading of Class 3 also covers liquid desensitized explosives. Liquid desensitized explosives are explosive substances which are dissolved or suspended in water or other liquid substances, to form an homogeneous liquid mixture to suppress their explosive properties. Such entries in Table A of Chapter 3.2 are UN Nos. 1204, 2059, 3064, 3343, 3357 and 3379.

For the purpose of carriage in tank vessels, the heading of Class 3 also covers the following substances which:

- have a flash-point above 60° C and which are carried or handed over for carriage at a temperature within a range of 15 K below the flash-point;
- have an auto-ignition temperature of 200° C or below and which are not mentioned elsewhere.

***NOTE 1:** Substances having a flash-point above 35 °C, non-toxic and non-corrosive, which, do not sustain combustion according to the criteria of 32.2.5 of Part III of the Manual of Tests and Criteria are not substances of Class 3; if, however, these substances are handed over for carriage and carried whilst heated at temperatures equal to or higher than their flash-point, they are substances of Class 3.*

***NOTE 2:** By derogation from paragraph 2.2.3.1.1 above, diesel fuel, gasoil, heating oil (light) having a flash-point above 60 °C and not more than 100 °C shall be deemed substances of Class 3, UN No. 1202.*

***NOTE 3:** Liquids which are highly toxic on inhalation, having a flash-point below 23 °C and toxic substances, having a flash-point of 23 °C or above are substances of Class 6.1 (see 2.2.61.1).*

***NOTE 4:** Flammable liquid substances and preparations used as pesticides, which are highly toxic, toxic or slightly toxic and have a flash-point of 23 °C or above are substances of Class 6.1 (see 2.2.61.1).*

***NOTE 5:** For the purpose of carriage in tank vessels, substances having a flash-point above 60° C and not more than 100° C are substances of Class 9 (identification number 9003).*

2.2.3.1.2 The substances and articles of Class 3 are subdivided as follows:

- F Flammable liquids, without subsidiary risk:
- F1 Flammable liquids having a flash-point of or below 60 °C;
 - F2 Flammable liquids having a flash-point above 60 °C which are carried or handed over for carriage at or above their flash-point (elevated temperature substances);
 - F3 Substances having a flash-point above 60° C which are carried or handed over for carriage at a temperature within a range of 15 K below the flash-point;
 - F4 Substances having an auto-ignition temperature of 200° C or below and which are not mentioned elsewhere.
- FT Flammable liquids, toxic:
- FT1 Flammable liquids, toxic;
 - FT2 Pesticides;
- FC Flammable liquids, corrosive;
- FTC Flammable liquids, toxic, corrosive;
- D Liquid desensitized explosives.

2.2.3.1.3 Substances and articles classified in Class 3 are listed in Table A of Chapter 3.2. Substances not mentioned by name in Table A of Chapter 3.2 shall be assigned to the relevant entry of 2.2.3.3 and the relevant packing group in accordance with the provisions of this section. Flammable liquids shall be assigned to one of the following packing groups according to the degree of danger they present for carriage:

Packing Group	Flash-point (closed cup)	Initial boiling point
I	--	≤ 35°C
II ^a	< 23°C	> 35°C
III ^a	≥ 23°C and ≤ 60°C	> 35°C

^a See also 2.2.3.1.4

For a liquid with (a) subsidiary risk(s), the packing group determined in accordance with the table above and the packing group based on the severity of the subsidiary risk(s) shall be considered; the classification and packing group shall then be determined in accordance with the table of precedence of hazards in 2.1.3.10.

2.2.3.1.4 Liquid or viscous mixtures and preparations, including those containing no more than 20% nitrocellulose with a nitrogen content not exceeding 12.6% (by dry mass), shall be assigned to packing group III only if the following requirements are met:

- (a) the height of the separated layer of solvent is less than 3 % of the total height of the sample in the solvent-separation test (see Manual of Tests and Criteria, Part III, subsection 32.5.1); and
- (b) the viscosity² and flash-point are in accordance with the following table:

² *Viscosity determination:* Where the substance concerned is non-Newtonian, or where a flow cup method of viscosity determination is otherwise unsuitable, a variable shear-rate viscometer shall be used to determine the dynamic viscosity coefficient of the substance, at 23 °C, at a number of shear rates. The values obtained are plotted against shear rate and then extrapolated to zero shear rate. The dynamic viscosity thus obtained, divided by the density, gives the apparent kinematic viscosity at near-zero shear rate.

Kinematic viscosity (extrapolated) v (at near-zero shear rate) mm ² /s at 23 °C	Flow time t in accordance with ISO 2431:1993		Flash-point in °C
	in s	Jet diameter in mm	
20 < v ≤ 80	20 < t ≤ 60	4	above 17
80 < v ≤ 135	60 < t ≤ 100	4	above 10
135 < v ≤ 220	20 < t ≤ 32	6	above 5
220 < v ≤ 300	32 < t ≤ 44	6	above -1
300 < v ≤ 700	44 < t ≤ 100	6	above -5
700 < <	100 < t	6	-5 and below

NOTE: Mixtures containing more than 20% but not more than 55% nitrocellulose with a nitrogen content not exceeding 12.6% by dry mass are substances assigned to UN No. 2059.

Mixtures having a flash-point below 23 °C and containing:

- more than 55 % nitrocellulose, whatever their nitrogen content; or
- not more than 55 % nitrocellulose with a nitrogen content above 12.6 % by dry mass,

are substances of Class 1 (UN Nos. 0340 or 0342) or of Class 4.1 (UN Nos. 2555, 2556 or 2557).

2.2.3.1.5 Non-toxic, non-corrosive and non-environmentally hazardous solutions and homogeneous mixtures having a flash-point of 23 °C or above (viscous substances, such as paints or varnishes, excluding substances containing more than 20 % nitrocellulose) packed in receptacles of less than 450 litres capacity, are not subject to ADN if, in the solvent-separation test (see Manual of Tests and Criteria, Part III, sub-section 32.5.1), the height of the separated layer of solvent is less than 3 % of the total height, and if the substances at 23 °C have, in the flow cup conforming to ISO 2431:1993 having a jet 6 mm in diameter, a flow time of:

- (a) not less than 60 seconds, or
- (b) not less than 40 seconds and contain not more than 60 % of substances of Class 3.

2.2.3.1.6 If substances of Class 3, as a result of admixtures, come into categories of risk different from those to which the substances mentioned by name in Table A of Chapter 3.2 belong, these mixtures or solutions shall be assigned to the entries to which they belong on the basis of their actual degree of danger.

NOTE: For the classification of solutions and mixtures (such as preparations and wastes) see also 2.1.3.

2.2.3.1.7 On the basis of the test procedures in accordance with 2.3.3.1 and 2.3.4, and the criteria set out in 2.2.3.1.1, it may also be determined whether the nature of a solution or a mixture mentioned by name or containing a substance mentioned by name is such that the solution or mixture is not subject to the provisions for this Class (see also 2.1.3).

2.2.3.2 Substances not accepted for carriage

2.2.3.2.1 Substances of Class 3 which are liable to form peroxides easily (as happens with ethers or with certain heterocyclic oxygenated substances) shall not be accepted for carriage if their peroxide content, calculated as hydrogen peroxide (H₂O₂), exceeds 0.3%. The peroxide content shall be determined as indicated in 2.3.3.2.

- 2.2.3.2.2 The chemically unstable substances of Class 3 shall not be accepted for carriage unless the necessary steps have been taken to prevent their dangerous decomposition or polymerization during carriage. To this end, it shall be ensured in particular that receptacles and tanks do not contain any substance liable to promote these reactions.
- 2.2.3.2.3 Liquid desensitized explosives other than those listed in Table A of Chapter 3.2 shall not be accepted for carriage as substances of Class 3.

2.2.3.3 *List of collective entries*

Flammable liquids			1133 ADHESIVES containing flammable liquid
			1136 COAL TAR DISTILLATES, FLAMMABLE
			1139 COATING SOLUTION (includes surface treatments or coatings used for industrial or other purposes such as vehicle undercoating, drum or barrel lining)
			1169 EXTRACTS, AROMATIC, LIQUID
			1197 EXTRACTS, FLAVOURING, LIQUID
			1210 PRINTING INK, flammable or
			1210 PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable
			1263 PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or
			1263 PAINT RELATED MATERIAL (including paint thinning or reducing compound)
			1266 PERFUMERY PRODUCTS with flammable solvents
			1293 TINCTURES, MEDICINAL
			1306 WOOD PRESERVATIVES, LIQUID
		F1	1866 RESIN SOLUTION, flammable
			1999 TARS, LIQUID, including road asphalt and oils, bitumen and cut backs
			3065 ALCOHOLIC BEVERAGES
			3269 POLYESTER RESIN KITS
			1224 KETONES, LIQUID, N.O.S.
			1268 PETROLEUM DISTILLATES, N.O.S. or
			1268 PETROLEUM PRODUCTS, N.O.S.
			1987 ALCOHOLS, N.O.S.
			1989 ALDEHYDES, N.O.S.
			2319 TERPENE HYDROCARBONS, N.O.S.
			3271 ETHERS, N.O.S.
			3272 ESTERS, N.O.S.
			3295 HYDROCARBONS, LIQUID, N.O.S.
			3336 MERCAPTANS, LIQUID, FLAMMABLE, N.O.S. or
			3336 MERCAPTANS MIXTURE, LIQUID, FLAMMABLE, N.O.S.
			1993 FLAMMABLE LIQUID, N.O.S.
Without subsidiary risk			3256 ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S., with flash-point above 60 °C, at or above its flash-point
			9001 SUBSTANCES HAVING A FLASH-POINT ABOVE 60 °C carried or handed over for carriage at a TEMPERATURE WITHIN A RANGE OF 15 K BELOW THE FLASH-POINT
	elevated temperature	F2	9002 SUBSTANCES WITH A SELF-IGNITION TEMPERATURE OF 200 °C AND BELOW, n.o.s.
			F3
		F4	1228 MERCAPTANS, LIQUID, FLAMMABLE, TOXIC, N.O.S. or
			1228 MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, TOXIC, N.O.S.
		FT1	1986 ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.
			1988 ALDEHYDES, FLAMMABLE, TOXIC, N.O.S.
			2478 ISOCYANATES, FLAMMABLE, TOXIC, N.O.S. or
			2478 ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S.
			3248 MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S.
			3273 NITRILES, FLAMMABLE, TOXIC, N.O.S.
Toxic			1992 FLAMMABLE LIQUID, TOXIC, N.O.S.
			FT

(cont'd)

2.2.3.3 List of collective entries (cont'd)

Toxic		
FT		2758 CARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC 2760 ARSENICAL PESTICIDE, LIQUID, FLAMMABLE, TOXIC 2762 ORGANOCHLORINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC 2764 TRIAZINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC 2772 THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC 2776 COPPER BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC 2778 MERCURY BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC 2780 SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, FLAMMABLE, TOXIC 2782 BIPYRIDILIUM PESTICIDE, LIQUID, FLAMMABLE, TOXIC 2784 ORGANOPHOSPHORUS PESTICIDE, LIQUID, FLAMMABLE, TOXIC 2787 ORGANOTIN PESTICIDE, LIQUID, FLAMMABLE, TOXIC 3024 COUMARIN DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC 3346 PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC 3350 PYRETHROID PESTICIDE, LIQUID, FLAMMABLE TOXIC 3021 PESTICIDE, LIQUID, FLAMMABLE, TOXIC, N.O.S.
	Pesticide (f.p.<23 °C)	FT2
	<i>NOTE : The classification of a pesticide under an entry shall be effected on the basis of the active ingredient, of the physical state of the pesticide and any subsidiary risks it may exhibit.</i>	
Corrosive		3469 PAINT, FLAMMABLE, CORROSIVE (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or 3469 PAINT RELATED MATERIAL, FLAMMABLE, CORROSIVE (including paint thinning or reducing compound) 2733 AMINES, FLAMMABLE, CORROSIVE, N.O.S. or 2733 POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S. 2985 CHLOROSILANES, FLAMMABLE, CORROSIVE, N.O.S. 3274 ALCOHOLATES SOLUTION, N.O.S., in alcohol 2924 FLAMMABLE LIQUID, CORROSIVE, N.O.S.
		FC
Toxic, corrosive		3286 FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.
		FTC
Liquid desensitised Explosive		3343 NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, FLAMMABLE, N.O.S. with not more than 30% nitroglycerin by mass 3357 NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, N.O.S. with not more than 30% nitroglycerin by mass 3379 DESENSITIZED EXPLOSIVE, LIQUID, N.O.S.
		D

2.2.41 Class 4.1 Flammable solids, self-reactive substances and solid desensitized explosives**2.2.41.1 Criteria**

2.2.41.1.1 The heading of Class 4.1 covers flammable substances and articles, desensitized explosives which are solids according to subparagraph (a) of the definition "solid" in 1.2.1 and self-reactive liquids or solids.

The following are assigned to Class 4.1:

- readily flammable solid substances and articles (see paragraphs 2.2.41.1.3 to 2.2.41.1.8);
- self-reactive solids or liquids (see paragraphs 2.2.41.1.9 to 2.2.41.1.17);
- solid desensitized explosives (see 2.2.41.1.18);
- substances related to self-reactive substances (see 2.2.41.1.19).

2.2.41.1.2 The substances and articles of Class 4.1 are subdivided as follows:

F Flammable solids, without subsidiary risk:

- F1 Organic;
- F2 Organic, molten;
- F3 Inorganic;

FO Flammable solids, oxidizing;

FT Flammable solids, toxic:

- FT1 Organic, toxic;
- FT2 Inorganic, toxic;

FC Flammable solids, corrosive:

- FC1 Organic, corrosive;
- FC2 Inorganic, corrosive;

D Solid desensitized explosives without subsidiary risk;

DT Solid desensitized explosives, toxic;

SR Self-reactive substances:

- SR1 Not requiring temperature control;
- SR2 Requiring temperature control.

*Flammable solids**Definition and properties*

- 2.2.41.1.3 *Flammable solids* are readily combustible solids and solids which may cause fire through friction.

Readily combustible solids are powdered, granular, or pasty substances which are dangerous if they can be easily ignited by brief contact with an ignition source, such as a burning match, and if the flame spreads rapidly. The danger may come not only from the fire but also from toxic combustion products. Metal powders are especially dangerous because of the difficulty of extinguishing a fire since normal extinguishing agents such as carbon dioxide or water can increase the hazard.

Classification

- 2.2.41.1.4 Substances and articles classified as flammable solids of Class 4.1 are listed in Table A of Chapter 3.2. The assignment of organic substances and articles not mentioned by name in Table A of Chapter 3.2 to the relevant entry of sub-section 2.2.41.3 in accordance with the provisions of Chapter 2.1 can be based on experience or on the results of the test procedures in accordance with Part III, sub-section 33.2.1 of the Manual of Tests and Criteria. The assignment of inorganic substances not mentioned by name shall be based on the results of the test procedures in accordance with Part III, sub-section 33.2.1 of the Manual of Tests and Criteria; experience shall also be taken into account when it leads to a more stringent assignment.

- 2.2.41.1.5 When substances not mentioned by name are assigned to one of the entries listed in 2.2.41.3 on the basis of the test procedures in accordance with the Manual of Tests and Criteria, Part III, sub-section 33.2.1, the following criteria apply:

- (a) With the exception of metal powders or powders of metal alloys, powdery, granular or pasty substances shall be classified as readily flammable substances of Class 4.1 if they can be easily ignited by brief contact with an ignition source (e.g. a burning match), or if, in the event of ignition, the flame spreads rapidly, the burning time is less than 45 seconds for a measured distance of 100 mm or the rate of burning is greater than 2.2 mm/s.
- (b) Metal powders or powders of metal alloys shall be assigned to Class 4.1 if they can be ignited by a flame and the reaction spreads over the whole length of the sample in 10 minutes or less.

Solids which may cause fire through friction shall be classified in Class 4.1 by analogy with existing entries (e.g. matches) or in accordance with any appropriate special provision.

- 2.2.41.1.6 On the basis of the test procedure in accordance with the Manual of Tests and Criteria, Part III, Section 33.2.1 and the criteria set out in 2.2.41.1.4 and 2.2.41.1.5, it may also be determined whether the nature of a substance mentioned by name is such that the substance is not subject to the provisions for this Class.

- 2.2.41.1.7 If substances of Class 4.1, as a result of admixtures, come into different categories of risk from those to which the substances mentioned by name in Table A of Chapter 3.2 belong, these mixtures shall be assigned to the entries to which they belong on the basis of their actual degree of danger.

NOTE: For the classification of solutions and mixtures (such as preparations and wastes), see also 2.1.3.

Assignment of packing groups

2.2.41.1.8 Flammable solids classified under the various entries in Table A of Chapter 3.2 shall be assigned to packing groups II or III on the basis of test procedures of the Manual of Tests and Criteria, Part III, sub-section 33.2.1, in accordance with the following criteria:

- (a) Readily flammable solids which, when tested, have a burning time of less than 45 seconds over a measured distance of 100 mm shall be assigned to:

Packing group II: if the flame passes the wetted zone;

Packing group III: if the wetted zone stops the flame for at least four minutes;

- (b) Metal powders or powders of metal alloys shall be assigned to:

Packing group II: if, when tested, the reaction spreads over the whole length of the sample in five minutes or less;

Packing group III: if, when tested, the reaction spreads over the whole length of the sample in more than five minutes.

For solids which may cause fire through friction, the packing group shall be assigned by analogy with existing entries or in accordance with any special provision.

*Self-reactive substances**Definitions*

2.2.41.1.9 For the purposes of ADN, *self-reactive substances* are thermally unstable substances liable to undergo a strongly exothermic decomposition even without participation of oxygen (air). Substances are not considered to be self-reactive substances of Class 4.1, if:

- (a) they are explosives according to the criteria of Class 1;
- (b) they are oxidizing substances according to the classification procedure for Class 5.1 (see 2.2.51.1) except that mixtures of oxidizing substances which contain 5.0% or more of combustible organic substances shall be subjected to the classification procedure defined in Note 2;
- (c) they are organic peroxides according to the criteria of Class 5.2 (see 2.2.52.1);
- (d) their heat of decomposition is less than 300 J/g; or
- (e) their self-accelerating decomposition temperature (SADT) (see NOTE 2 below) is greater than 75 °C for a 50 kg package.

NOTE 1: *The heat of decomposition can be determined using any internationally recognised method e.g. differential scanning calorimetry and adiabatic calorimetry.*

NOTE 2: *Mixtures of oxidizing substances meeting the criteria of Class 5.1 which contain 5.0% or more of combustible organic substances, which do not meet the criteria mentioned in (a), (c), (d) or (e) above, shall be subjected to the self-reactive substance classification procedure.*

A mixture showing the properties of a self-reactive substance, type B to F, shall be classified as a self-reactive substance of Class 4.1.

A mixture showing the properties of a self-reactive substance, type G, according to the principle given in 20.4.3 (g) of Part II of the Manual of Tests and Criteria shall be considered for classification as a substance of Class 5.1 (see 2.2.51.1).

NOTE 3: *The self-accelerating decomposition temperature (SADT) is the lowest temperature at which self-accelerating decomposition may occur with a substance in the packaging as used during carriage. Requirements for the determination of the SADT are given in the Manual of Tests and Criteria, Part II, Chapter 20 and section 28.4.*

NOTE 4: *Any substance which shows the properties of a self-reactive substance shall be classified as such, even if this substance gives a positive test result according to 2.2.42.1.5 for inclusion in Class 4.2.*

Properties

- 2.2.41.1.10 The decomposition of self-reactive substances can be initiated by heat, contact with catalytic impurities (e.g. acids, heavy-metal compounds, bases), friction or impact. The rate of decomposition increases with temperature and varies with the substance. Decomposition, particularly if no ignition occurs, may result in the evolution of toxic gases or vapours. For certain self-reactive substances, the temperature shall be controlled. Some self-reactive substances may decompose explosively, particularly if confined. This characteristic may be modified by the addition of diluents or by the use of appropriate packagings. Certain self-reactive substances burn vigorously. Self-reactive substances are, for example, some compounds of the types listed below:

aliphatic azo compounds (-C-N=N-C-);
 organic azides (-C-N₃);
 diazonium salts (-CN₂⁺ Z⁻);
 N-nitroso compounds (-N-N=O); and
 aromatic sulphohydrazides (-SO₂-NH-NH₂).

This list is not exhaustive and substances with other reactive groups and some mixtures of substances may have similar properties.

Classification

- 2.2.41.1.11 Self-reactive substances are classified into seven types according to the degree of danger they present. The types of self-reactive substances range from type A, which is not accepted for carriage in the packaging in which it is tested, to type G, which is not subject to the provisions for self-reactive substances of Class 4.1. The classification of types B to F is directly related to the maximum quantity allowed in one packaging. The principles to be applied for classification as well as the applicable classification procedures, test methods and criteria and an example of a suitable test report are given in Part II of the Manual of Tests and Criteria.
- 2.2.41.1.12 Self-reactive substances which have already been classified and are already permitted for carriage in packagings are listed in 2.2.41.4, those already permitted for carriage in IBCs are listed in 4.1.4.2 of ADR, packing instruction IBC520 and those already permitted for carriage in tanks according to Chapter 4.2 of ADR are listed in 4.2.5.2 of ADR, portable tank instruction T23. Each permitted substance listed is assigned to a generic entry of Table A of Chapter 3.2 (UN Nos. 3221 to 3240), and appropriate subsidiary risks and remarks providing relevant transport information are given.

The collective entries specify:

- self-reactive substances types B to F, see 2.2.41.1.11 above;

- physical state (liquid/solid); and
- temperature control (when required), see 2.2.41.1.17 below.

The classification of the self-reactive substances listed in 2.2.41.4 is based on the technically pure substance (except where a concentration of less than 100% is specified).

- 2.2.41.1.13 Classification of self-reactive substances not listed in 2.2.41.4, 4.1.4.2 of ADR, packing instruction IBC520 or 4.2.5.2 of ADR, portable tank instruction T23 and assignment to a collective entry shall be made by the competent authority of the country of origin on the basis of a test report. The statement of approval shall contain the classification and the relevant conditions of carriage. If the country of origin is not a Contracting Party to ADN, the classification and the conditions of carriage shall be recognized by the competent authority of the first country Contracting Party to ADN reached by the consignment.
- 2.2.41.1.14 Activators, such as zinc compounds, may be added to some self-reactive substances to change their reactivity. Depending on both the type and the concentration of the activator, this may result in a decrease in thermal stability and a change in explosive properties. If either of these properties is altered, the new formulation shall be assessed in accordance with the classification procedure.
- 2.2.41.1.15 Samples of self-reactive substances or formulations of self-reactive substances not listed in 2.2.41.4, for which a complete set of test results is not available and which are to be carried for further testing or evaluation, shall be assigned to one of the appropriate entries for self-reactive substances type C provided the following conditions are met:
- the available data indicate that the sample would be no more dangerous than self-reactive substances type B;
 - the sample is packaged in accordance with packing method OP2 of 4.1.4.1 of ADR and the quantity per cargo transport unit and per transport unit is limited to 10 kg;
 - the available data indicate that the control temperature, if any, is sufficiently low to prevent any dangerous decomposition and sufficiently high to prevent any dangerous phase separation.

Desensitization

- 2.2.41.1.16 In order to ensure safety during carriage, self-reactive substances are in many cases desensitized by use of a diluent. Where a percentage of a substance is stipulated, this refers to the percentage by mass, rounded to the nearest whole number. If a diluent is used, the self-reactive substance shall be tested with the diluent present in the concentration and form used in carriage. Diluents which may allow a self-reactive substance to concentrate to a dangerous extent in the event of leakage from a packaging shall not be used. Any diluent shall be compatible with the self-reactive substance. In this regard, compatible diluents are those solids or liquids which have no detrimental influence on the thermal stability and hazard type of the self-reactive substance. Liquid diluents in formulations requiring temperature control (see 2.2.41.1.14) shall have a boiling point of at least 60 °C and a flash-point not less than 5 °C. The boiling point of the liquid shall be at least 50 °C higher than the control temperature of the self-reactive substance.

Temperature control requirements

- 2.2.41.1.17 Certain self-reactive substances may only be carried under temperature controlled conditions. The control temperature is the maximum temperature at which the self-reactive

substance can be safely carried. It is assumed that the temperature of the immediate surroundings of a package only exceeds 55 °C during carriage for a relatively short time in a 24 hour period. In the event of loss of temperature control, it may be necessary to implement emergency procedures. The emergency temperature is the temperature at which such procedures shall be implemented.

The control and emergency temperatures are derived from the SADT (see table 1). The SADT shall be determined in order to decide whether a substance shall be subjected to temperature control during carriage. Provisions for the determination of the SADT are given in the Manual of Tests and Criteria, Part II, Chapter 20 and Section 28.4.

Table 1 Derivation of control and emergency temperatures

Type of receptacle	SADT ^a	Control temperature	Emergency temperature
Single packagings and IBCs	20 °C or less	20 °C below SADT	10 °C below SADT
	over 20 °C to 35 °C	15 °C below SADT	10 °C below SADT
	over 35 °C	10 °C below SADT	5 °C below SADT
Tanks	not greater than 50 °C	10 °C below SADT	5 °C below SADT

^a SADT of the substance as packaged for carriage.

Self-reactive substances with an SADT not greater than 55 °C shall be subject to temperature control during carriage. Where applicable, control and emergency temperatures are listed in 2.2.41.4. The actual temperature during carriage may be lower than the control temperature but shall be selected so as to avoid dangerous separation of phases.

Solid desensitized explosives

2.2.41.1.18 Solid desensitized explosives are substances which are wetted with water or alcohols or are diluted with other substances to suppress their explosive properties. Such entries in Table A of Chapter 3.2 are: UN Nos. 1310, 1320, 1321, 1322, 1336, 1337, 1344, 1347, 1348, 1349, 1354, 1355, 1356, 1357, 1517, 1571, 2555, 2556, 2557, 2852, 2907, 3317, 3319, 3344, 3364, 3365, 3366, 3367, 3368, 3369, 3370, 3376, 3380 and 3474.

Substances related to self-reactive substances

2.2.41.1.19 Substances that:

- (a) have been provisionally accepted into Class 1 according to Test Series 1 and 2 but exempted from Class 1 by Test Series 6;
- (b) are not self-reactive substances of Class 4.1; and
- (c) are not substances of Classes 5.1 or 5.2

are also assigned to Class 4.1. UN Nos. 2956, 3241, 3242 and 3251 are such entries.

2.2.41.2 Substances not accepted for carriage

2.2.41.2.1 The chemically unstable substances of Class 4.1 shall not be accepted for carriage unless the necessary steps have been taken to prevent their dangerous decomposition or polymerization

during carriage. To this end, it shall in particular be ensured that receptacles and tanks do not contain any substance liable to promote these reactions.

2.2.41.2.2 Flammable solids, oxidizing, assigned to UN No. 3097 shall not be accepted for carriage unless they meet the requirements for Class 1 (see also 2.1.3.7).

2.2.41.2.3 The following substances shall not be accepted for carriage:

- Self-reactive substances of type A (see Manual of Tests and Criteria, Part II, paragraph 20.4.2 (a));
- Phosphorus sulphides which are not free from yellow and white phosphorus;
- Solid sensitized explosives other than those listed in Table A of Chapter 3.2;
- Inorganic flammable substances in the molten form other than UN No. 2448 SULPHUR, MOLTEN;
- Barium azide with a water content less than 50% (mass).

2.2.41.3 List of collective entries

Flammable solids	without subsidiary risk	organic	F1	3175 SOLIDS CONTAINING FLAMMABLE LIQUID, N.O.S. 1353 FIBRES IMPREGNATED WITH WEAKLY NITRATED NITROCELLULOSE, N.O.S. or 1353 FABRICS IMPREGNATED WITH WEAKLY NITRATED NITROCELLULOSE, N.O.S. 1325 FLAMMABLE SOLID, ORGANIC, N.O.S.
		organic molten	F2	3176 FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.
		inorganic	F3	3089 METAL POWDER, FLAMMABLE, N.O.S. ^{a b} 3181 METAL SALTS OF ORGANIC COMPOUNDS, FLAMMABLE, N.O.S. 3182 METAL HYDRIDES, FLAMMABLE, N.O.S. ^c 3178 FLAMMABLE SOLID, INORGANIC, N.O.S.
		oxidizing	FO	3097 FLAMMABLE SOLID, OXIDIZING, N.O.S. (not allowed, see Para. 2.2.41.2.2)
Solid desensitized explosives	toxic	organic	FT1	2926 FLAMMABLE SOLID, TOXIC, ORGANIC, N.O.S.
		inorganic	FT2	3179 FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S.
	corrosive	organic	FC1	2925 FLAMMABLE SOLID, CORROSIVE, ORGANIC, N.O.S.
		inorganic	FC2	3180 FLAMMABLE SOLID, CORROSIVE, INORGANIC, N.O.S.
without subsidiary risk	D	3319 NITROGLYCERIN MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 2% but not more than 10% nitroglycerin by mass 3344 PENTAERYTHRITOL TETRANITRATE (PENTAERYTHRITOL TETRANITRATE, PETN) MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 10% but not more than 20% PETN by mass 3380 DESENSITIZED EXPLOSIVE, SOLID, N.O.S.		
	DT	Only substances listed in Table A of Chapter 3.2 are to be accepted for carriage as substances of Class 4.1		
Self-reactive substances	not requiring temperature control	SR1	SELF-REACTIVE LIQUID TYPE A } Not accepted for carriage, SELF-REACTIVE SOLID TYPE A } see 2.2.41.2.3	
			3221 SELF-REACTIVE LIQUID TYPE B	
			3222 SELF-REACTIVE SOLID TYPE B	
			3223 SELF-REACTIVE LIQUID TYPE C	
			3224 SELF-REACTIVE SOLID TYPE C	
			3225 SELF-REACTIVE LIQUID TYPE D	
			3226 SELF-REACTIVE SOLID TYPE D	
			3227 SELF-REACTIVE LIQUID TYPE E	
			3228 SELF-REACTIVE SOLID TYPE E	
			3229 SELF-REACTIVE LIQUID TYPE F	
3230 SELF-REACTIVE SOLID TYPE F				
SELF-REACTIVE LIQUID TYPE G } Not subject to the provisions applicable to SELF-REACTIVE SOLID TYPE G } Class 4.1, see 2.2.41.1.11				
SR	requiring temperature control	SR2	3231 SELF-REACTIVE LIQUID TYPE B, TEMPERATURE CONTROLLED	
			3232 SELF-REACTIVE SOLID TYPE B, TEMPERATURE CONTROLLED	
			3233 SELF-REACTIVE LIQUID TYPE C, TEMPERATURE CONTROLLED	
			3234 SELF-REACTIVE SOLID TYPE C, TEMPERATURE CONTROLLED	
			3235 SELF-REACTIVE LIQUID TYPE D, TEMPERATURE CONTROLLED	
			3236 SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED	
			3237 SELF-REACTIVE LIQUID TYPE E, TEMPERATURE CONTROLLED	
			3238 SELF-REACTIVE SOLID TYPE E, TEMPERATURE CONTROLLED	
			3239 SELF-REACTIVE LIQUID TYPE F, TEMPERATURE CONTROLLED	
			3240 SELF-REACTIVE SOLID TYPE F, TEMPERATURE CONTROLLED	

^a Metals and metal alloys in powdered or other flammable form, liable to spontaneous combustion, are substances of Class 4.2.

^b Metals and metal alloys in powdered or other flammable form, which in contact with water, emit flammable gases, are substances of Class 4.3.

^c Metals hydrides which, in contact with water, emit flammable gases, are substances of Class 4.3. Aluminium borohydride or aluminium borohydride in devices are substances of Class 4.2, UN No. 2870.

2.2.41.4 List of currently assigned self-reactive substances in packagings

In the column "Packing Method" codes "OP1" to "OP8" refer to packing methods in 4.1.4.1 of ADR, packing instruction P520 (see also 4.1.7.1 of ADR). Self-reactive substances to be carried shall fulfil the classification and the control and emergency temperatures (derived from the SADT) as listed. For substances permitted in IBCs, see 4.1.4.2 of ADR, packing instruction IBC520 and, for those permitted in tanks according Chapter 4.2 of ADR, see 4.2.5.2 of ADR, portable tank instruction T23.

NOTE: The classification given in this table is based on the technically pure substance (except where a concentration of less than 100 % is specified). For other concentrations, the substance may be classified differently following the procedures given in Part II of the Manual of Tests and Criteria and in 2.2.41.1.17.

SELF-REACTIVE SUBSTANCE	Concentration (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	UN generic entry	Remarks
ACETONE-PYROGALLOL COPOLYMER 2-DIAZO-1-NAPHTHOL-5-SULPHONATE	100	OP8			3228	
AZODICARBONAMIDE FORMULATION TYPE B, TEMPERATURE CONTROLLED	< 100	OP5			3232	(1) (2)
AZODICARBONAMIDE FORMULATION TYPE C	< 100	OP6			3224	(3)
AZODICARBONAMIDE FORMULATION TYPE C, TEMPERATURE CONTROLLED	< 100	OP6			3234	(4)
AZODICARBONAMIDE FORMULATION TYPE D	< 100	OP7			3226	(5)
AZODICARBONAMIDE FORMULATION TYPE D, TEMPERATURE CONTROLLED	< 100	OP7			3236	(6)
2,2' -AZODI(2,4-DIMETHYL- 4-METHOXYVALERONITRILE)	100	OP7	-5	+5	3236	
2,2' -AZODI(2,4-DIMETHYL- VALERONITRILE)	100	OP7	+10	+15	3236	
2,2' -AZODI(ETHYL- 2-METHYLPROPIONATE)	100	OP7	+20	+25	3235	
1,1-AZODI(HEXAHYDROBENZONITRILE)	100	OP7			3226	
2,2' -AZODI(ISOBUTYRONITRILE)	100	OP6	+40	+45	3234	
2,2' -AZODI(ISOBUTYRONITRILE) as a water based paste	≤ 50	OP6			3224	
2,2' -AZODI(2-METHYLBUTYRO- NITRILE)	100	OP7	+35	+40	3236	
BENZENE-1,3-DISULPHONYL HYDRAZIDE, as a paste	52	OP7			3226	
BENZENE SULPHONYL HYDRAZIDE	100	OP7			3226	
4-(BENZYL(ETHYL)AMINO)-3-ETHOXY- BENZENEDIAZONIUM ZINC CHLORIDE	100	OP7			3226	
4-(BENZYL(METHYL)AMINO)-3- ETHOXYBENZENEDIAZONIUM ZINC CHLORIDE	100	OP7	+40	+45	3236	
3-CHLORO-4-DIETHYLAMINOBENZENE- DIAZONIUM ZINC CHLORIDE	100	OP7			3226	

2.2.41.4 List of currently assigned self-reactive substances in packagings (cont'd)

SELF-REACTIVE SUBSTANCE	Concentration (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	UN generic entry	Remarks
2-DIAZO-1-NAPHTHOL-4-SULPHONYL CHLORIDE	100	OP5			3222	(2)
2-DIAZO-1-NAPHTHOL-5-SULPHONYL CHLORIDE	100	OP5			3222	(2)
2-DIAZO-1-NAPHTHOL SULPHONIC ACID ESTER MIXTURE, TYPE D	< 100	OP7			3226	(9)
2,5-DIBUTOXY-4-(4-MORPHOLINYL)-BENZENEDIAZONIUM, TETRACHLOROZINCATE (2:1)	100	OP8			3228	
2,5-DIETHOXY-4-MORPHOLINO-BENZENEDIAZONIUM ZINC CHLORIDE	67-100	OP7	+35	+40	3236	
2,5-DIETHOXY-4-MORPHOLINO-BENZENEDIAZONIUM ZINC CHLORIDE	66	OP7	+40	+45	3236	
2,5-DIETHOXY-4-MORPHOLINO-BENZENEDIAZONIUM TETRAFLUOROBORATE	100	OP7	+30	+35	3236	
2,5-DIETHOXY-4-(4-MORPHOLINYL)-BENZENEDIAZONIUM SULPHATE	100	OP7			3226	
2,5-DIETHOXY-4-(PHENYLSULPHONYL)-BENZENEDIAZONIUM ZINC CHLORIDE	67	OP7	+40	+45	3236	
DIETHYLENEGLYCOL BIS (ALLYL CARBONATE) + DI-ISOPROPYLPEROXYDICARBONATE	≥ 88 + ≤ 12	OP8	-10	0	3237	
2,5-DIMETHOXY-4-(4-METHYL-PHENYLSULPHONYL)BENZENEDIAZONIUM ZINC CHLORIDE	79	OP7	+40	+45	3236	
4-(DIMETHYLAMINO)-BENZENEDIAZONIUM TRICHLOROZINCATE (-1)	100	OP8			3228	
4-DIMETHYLAMINO-6-(2-DIMETHYL-AMINOETHOXY) TOLUENE-2-DIAZONIUM ZINC CHLORIDE	100	OP7	+40	+45	3236	
N,N'-DINITROSO-N,N'- DIMETHYL TEREPHTHALAMIDE, as a paste	72	OP6			3224	
N,N'-DINITROSOPENTAMETHYLENE-TETRAMINE	82	OP6			3224	(7)
DIPHENYLOXIDE-4,4'-DISULPHONYL HYDRAZIDE	100	OP7			3226	
4-DIPROPYLAMINO BENZENE-DIAZONIUM ZINC CHLORIDE	100	OP7			3226	
2-(N,N-ETHOXYCARBONYL-PHENYLAMINO)-3-METHOXY-4-(N-METHYL-N-CYCLOHEXYLAMINO) BENZENEDIAZONIUM ZINC CHLORIDE	63-92	OP7	+ 40	+ 45	3236	
2-(N,N-ETHOXYCARBONYL-PHENYLAMINO)-3-METHOXY-4-(N-METHYL-N-CYCLOHEXYLAMINO) BENZENEDIAZONIUM ZINC CHLORIDE	62	OP7	+ 35	+ 40	3236	

2.2.41.4 *List of currently assigned self-reactive substances in packagings (cont'd)*

SELF-REACTIVE SUBSTANCE	Concentration (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	UN generic entry	Remarks
N-FORMYL-2-(NITROMETHYLENE)-1,3-PERHYDROTHIAZINE	100	OP7	+45	+50	3236	
2-(2-HYDROXYETHOXY)-1-(PYRROLIDIN-1-YL)BENZENE-4-DIAZONIUM ZINC CHLORIDE	100	OP7	+45	+50	3236	
3-(2-HYDROXYETHOXY)-4-(PYRROLIDIN-1-YL)BENZENE DIAZONIUM ZINC CHLORIDE	100	OP7	+40	+45	3236	
2-(N,N-METHYLAMINOETHYL-CARBONYL)-4-(3,4-DIMETHYL-PHENYLSULPHONYL)BENZENE-DIAZONIUM HYDROGEN SULPHATE	96	OP7	+45	+50	3236	
4-METHYLBENZENESULPHONYL-HYDRAZIDE	100	OP7			3226	
3-METHYL-4-(PYRROLIDIN-1-YL)BENZENEDIAZONIUM TETRAFLUOROBORATE	95	OP6	+45	+50	3234	
4-NITROSOPHENOL	100	OP7	+35	+40	3236	
SELF-REACTIVE LIQUID, SAMPLE		OP2			3223	(8)
SELF-REACTIVE LIQUID, SAMPLE, TEMPERATURE CONTROLLED		OP2			3233	(8)
SELF-REACTIVE SOLID, SAMPLE		OP2			3224	(8)
SELF-REACTIVE SOLID, SAMPLE, TEMPERATURE CONTROLLED		OP2			3234	(8)
SODIUM 2-DIAZO-1-NAPHTHOL-4-SULPHONATE	100	OP7			3226	
SODIUM 2-DIAZO-1-NAPHTHOL-5-SULPHONATE	100	OP7			3226	
TETRAMINE PALLADIUM (II) NITRATE	100	OP6	+30	+35	3234	

Remarks

- (1) Azodicarbonamide formulations which fulfil the criteria of paragraph 20.4.2 (b) of the Manual of Tests and Criteria. The control and emergency temperatures shall be determined by the procedure given in 2.2.41.1.17.
- (2) "EXPLOSIVE" subsidiary risk label required (Model No. 1, see 5.2.2.2.2).
- (3) Azodicarbonamide formulations which fulfil the criteria of paragraph 20.4.2 (c) of the Manual of Tests and Criteria.
- (4) Azodicarbonamide formulations which fulfil the criteria of paragraph 20.4.2 (c) of the Manual of Tests and Criteria. The control and emergency temperatures shall be determined by the procedure given in 2.2.41.1.17.
- (5) Azodicarbonamide formulations which fulfil the criteria of paragraph 20.4.2 (d) of the Manual of Tests and Criteria.
- (6) Azodicarbonamide formulations which fulfil the criteria of paragraph 20.4.2 (d) of the Manual of Tests and Criteria. The control and emergency temperatures shall be determined by the procedure given in 2.2.41.1.17.

- (7) With a compatible diluent having a boiling point of not less than 150 °C.
- (8) See 2.2.41.1.15.
- (9) This entry applies to mixtures of esters of 2-diazo-1-naphthol-4-sulphonic acid and 2-diazo-1-naphthol-5-sulphonic acid which fulfil the criteria of paragraph 20.4.2 (d) of the *Manual of Test and Criteria*.

2.2.42 Class 4.2 Substances liable to spontaneous combustion**2.2.42.1 Criteria**

2.2.42.1.1 The heading of Class 4.2 covers:

- *Pyrophoric substances* which are substances, including mixtures and solutions (liquid or solid), which even in small quantities ignite on contact with air within five minutes. These are the Class 4.2 substances the most liable to spontaneous combustion; and
- *Self-heating substances and articles* which are substances and articles, including mixtures and solutions, which, on contact with air, without energy supply, are liable to self-heating. These substances will ignite only in large amounts (kilogrammes) and after long periods of time (hours or days).

2.2.42.1.2 The substances and articles of Class 4.2 are subdivided as follows:

S Substances liable to spontaneous combustion, without subsidiary risk:

- S1 Organic, liquid;
- S2 Organic, solid;
- S3 Inorganic, liquid;
- S4 Inorganic, solid;
- S5 Organometallic;

SW Substances liable to spontaneous combustion, which, in contact with water, emit flammable gases;

SO Substances liable to spontaneous combustion, oxidizing;

ST Substances liable to spontaneous combustion, toxic:

- ST1 Organic, toxic, liquid;
- ST2 Organic, toxic, solid;
- ST3 Inorganic, toxic, liquid;
- ST4 Inorganic, toxic, solid;

SC Substances liable to spontaneous combustion, corrosive:

- SC1 Organic, corrosive, liquid;
- SC2 Organic, corrosive, solid;
- SC3 Inorganic, corrosive, liquid;
- SC4 Inorganic, corrosive, solid.

Properties

2.2.42.1.3 Self-heating of these substances, leading to spontaneous combustion, is caused by reaction of the substance with oxygen (in the air) and the heat developed not being conducted away rapidly enough to the surroundings. Spontaneous combustion occurs when the rate of heat production exceeds the rate of heat loss and the auto-ignition temperature is reached.

Classification

2.2.42.1.4 Substances and articles classified in Class 4.2 are listed in Table A of Chapter 3.2. The assignment of substances and articles not mentioned by name in Table A of Chapter 3.2 to the relevant specific N.O.S. entry of 2.2.42.3 in accordance with the provisions of Chapter 2.1 can be based on experience or the results of the test procedures in accordance with the Manual of Tests and Criteria, Part III, Section 33.3. Assignment to general N.O.S. entries of Class 4.2 shall be based on the results of the test procedures in accordance with the Manual of Tests and Criteria, Part III, section 33.3; experience shall also be taken into account when it leads to a more stringent assignment.

2.2.42.1.5 When substances or articles not mentioned by name are assigned to one of the entries listed in 2.2.42.3 on the basis of the test procedures in accordance with the Manual of Tests and Criteria, Part III, section 33.3, the following criteria shall apply:

- (a) Solids liable to spontaneous combustion (pyrophoric) shall be assigned to Class 4.2 when they ignite on falling from a height of 1 m or within five minutes;
- (b) Liquids liable to spontaneous combustion (pyrophoric) shall be assigned to Class 4.2 when:
 - (i) on being poured on an inert carrier, they ignite within five minutes, or
 - (ii) in the event of a negative result of the test according to (i), when poured on a dry, indented filter paper (Whatman No. 3 filter), they ignite or carbonize it within five minutes;
- (c) Substances in which, in a 10 cm sample cube, at 140 °C test temperature, spontaneous combustion or a rise in temperature to over 200 °C is observed within 24 hours shall be assigned to Class 4.2. This criterion is based on the temperature of the spontaneous combustion of charcoal, which is at 50 °C for a sample cube of 27 m³. Substances with a temperature of spontaneous combustion higher than 50 °C for a volume of 27 m³ are not to be assigned to Class 4.2.

NOTE 1: Substances carried in packages with a volume of not more than 3 m³ are exempted from Class 4.2 if, tested with a 10 cm sample cube at 120 °C, no spontaneous combustion nor a rise in temperature to over 180 °C is observed within 24 hours.

NOTE 2: Substances carried in packages with a volume of not more than 450 litres are exempted from Class 4.2 if, tested with a 10 cm sample cube at 100 °C, no spontaneous combustion nor a rise in temperature to over 160 °C is observed within 24 hours.

NOTE 3: Since organometallic substances can be classified in Class 4.2 or 4.3 with additional subsidiary risks, depending on their properties, a specific classification flow chart for these substances is given in 2.3.5.

2.2.42.1.6 If substances of Class 4.2, as a result of admixtures, come into different categories of risk from those to which the substances mentioned by name in Table A of Chapter 3.2 belong, these mixtures shall be assigned to the entries to which they belong on the basis of their actual degree of danger.

NOTE: For the classification of solutions and mixtures (such as preparations and wastes), see also 2.1.3.

- 2.2.42.1.7 On the basis of the test procedure in the Manual of Tests and Criteria, Part III, section 33.3 and the criteria set out in 2.2.42.1.5, it may also be determined whether the nature of a substance mentioned by name is such that the substance is not subject to the provisions for this Class.

Assignment of packing groups

- 2.2.42.1.8 Substances and articles classified under the various entries in Table A of Chapter 3.2 shall be assigned to packing groups I, II or III on the basis of test procedures of the Manual of Tests and Criteria, Part III, section 33.3, in accordance with the following criteria:

- (a) Substances liable to spontaneous combustion (pyrophoric) shall be assigned to packing group I;
- (b) Self-heating substances and articles in which, in a 2.5 cm sample cube, at 140 °C test temperature, spontaneous combustion or a rise in temperature to over 200 °C is observed within 24 hours, shall be assigned to packing group II;
Substances with a temperature of spontaneous combustion higher than 50 °C for a volume of 450 litres are not to be assigned to packing group II;
- (c) Slightly self-heating substances in which, in a 2.5 cm sample cube, the phenomena referred to under (b) are not observed, in the given conditions, but in which in a 10 cm sample cube at 140 °C test temperature spontaneous combustion or a rise in temperature to over 200 °C is observed within 24 hours, shall be assigned to packing group III.

2.2.42.2 *Substances not accepted for carriage*

The following substances shall not be accepted for carriage:

- UN No. 3255 tert-BUTYL HYPOCHLORITE; and
- Self-heating solids, oxidizing, assigned to UN No. 3127 unless they meet the requirements for Class 1 (see 2.1.3.7).

2.2.42.3 List of collective entries

Substances liable to spontaneous combustion	organic	liquid	S1	2845 PYROPHORIC LIQUID, ORGANIC, N.O.S. 3183 SELF-HEATING LIQUID, ORGANIC, N.O.S.
		solid	S2	1373 FIBRES or FABRICS, ANIMAL or VEGETABLE or SYNTHETIC, N.O.S. with oil 2006 PLASTICS, NITROCELLULOSE-BASED, SELF-HEATING, N.O.S. 3313 ORGANIC PIGMENTS, SELF HEATING 2846 PYROPHORIC SOLID, ORGANIC, N.O.S. 3088 SELF-HEATING SOLID, ORGANIC, N.O.S.
Without subsidiary risk	inorganic	liquid	S3	3194 PYROPHORIC LIQUID, INORGANIC, N.O.S. 3186 SELF-HEATING LIQUID, INORGANIC, N.O.S.
S		solid	S4	1383 PYROPHORIC METAL, N.O.S. or 1383 PYROPHORIC ALLOY, N.O.S. 1378 METAL CATALYST, WETTED with a visible excess of liquid 2881 METAL CATALYST, DRY 3189 ^a METAL POWDER, SELF-HEATING, N.O.S. 3205 ALKALINE EARTH METAL ALCOHOLATES, N.O.S. 3200 PYROPHORIC SOLID, INORGANIC, N.O.S. 3190 SELF-HEATING SOLID, INORGANIC, N.O.S.
		organometallic	S5	3392 ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC 3391 ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC 3400 ORGANOMETALLIC SUBSTANCE, SOLID, SELF-HEATING
		Water-reactive	SW	3394 ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE 3393 ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC, WATER-REACTIVE
		Oxidizing	SO	3127 SELF-HEATING SOLID, OXIDIZING, N.O.S. (not allowed, see 2.2.42.2)
Toxic	organic	liquid	ST1	3184 SELF-HEATING LIQUID, TOXIC, ORGANIC, N.O.S.
		solid	ST2	3128 SELF-HEATING SOLID, TOXIC, ORGANIC, N.O.S.
ST	inorganic	liquid	ST3	3187 SELF-HEATING LIQUID, TOXIC, INORGANIC, N.O.S.
		solid	ST4	3191 SELF-HEATING SOLID, TOXIC, INORGANIC, N.O.S.
Corrosive	organic	liquid	SC1	3185 SELF-HEATING LIQUID, CORROSIVE, ORGANIC, N.O.S.
		solid	SC2	3126 SELF-HEATING SOLID, CORROSIVE, ORGANIC, N.O.S.
SC	inorganic	liquid	SC3	3188 SELF-HEATING LIQUID, CORROSIVE, INORGANIC, N.O.S.
		solid	SC4	3206 ALKALI METAL ALCOHOLATES, SELF-HEATING, CORROSIVE, N.O.S. 3192 SELF-HEATING SOLID, CORROSIVE, INORGANIC, N.O.S.

^a Dust and powder of metals, non toxic in a non-spontaneous combustible form which nevertheless, in contact with water, emit flammable gases, are substances of Class 4.3.

2.2.43 Class 4.3 Substances which, in contact with water, emit flammable gases**2.2.43.1 Criteria**

2.2.43.1.1 The heading of Class 4.3 covers substances which react with water to emit flammable gases liable to form explosive mixtures with air, and articles containing such substances.

2.2.43.1.2 Substances and articles of Class 4.3 are subdivided as follows:

W Substances which, in contact with water, emit flammable gases, without subsidiary risk, and articles containing such substances:

- W1 Liquid;
- W2 Solid;
- W3 Articles;

WF1 Substances which, in contact with water, emit flammable gases, liquid, flammable;

WF2 Substances which, in contact with water, emit flammable gases, solid, flammable;

WS Substances which, in contact with water, emit flammable gases, solid, self-heating;

WO Substances which, in contact with water, emit flammable gases, oxidizing, solid;

WT Substances which, in contact with water, emit flammable gases, toxic:

- WT1 Liquid;
- WT2 Solid;

WC Substances which, in contact with water, emit flammable gases, corrosive:

- WC1 Liquid;
- WC2 Solid;

WFC Substances which, in contact with water, emit flammable gases, flammable, corrosive.

Properties

2.2.43.1.3 Certain substances in contact with water may emit flammable gases that can form explosive mixtures with air. Such mixtures are easily ignited by all ordinary sources of ignition, for example naked lights, sparking handtools or unprotected light bulbs. The resulting blast wave and flames may endanger people and the environment. The test method referred to in 2.2.43.1.4 below is used to determine whether the reaction of a substance with water leads to the development of a dangerous amount of gases which may be flammable. This test method shall not be applied to pyrophoric substances.

Classification

2.2.43.1.4 Substances and articles classified in Class 4.3 are listed in Table A of Chapter 3.2. The assignment of substances and articles not mentioned by name in Table A of Chapter 3.2 to the relevant entry of 2.2.43.3 in accordance with the provisions of Chapter 2.1 shall be based on the results of the test procedure in accordance with the Manual of Tests and Criteria, Part III, Section 33.4; experience shall also be taken into account when it leads to a more stringent assignment.

2.2.43.1.5 When substances not mentioned by name are assigned to one of the entries listed in 2.2.43.3 on the basis of the test procedure in accordance with the Manual of Tests and Criteria, Part III, Section 33.4, the following criteria shall apply:

A substance shall be assigned to Class 4.3 if:

- (a) spontaneous ignition of the gas emitted takes place in any step of the test procedure; or
- (b) there is an evolution of flammable gas at a rate greater than 1 litre per kilogram of the substance to be tested per hour.

NOTE: Since organometallic substances can be classified in Classes 4.2 or 4.3 with additional subsidiary risks, depending on their properties, a specific classification flow chart for these substances is given in 2.3.5.

2.2.43.1.6 If substances of Class 4.3, as a result of admixtures, come into different categories of risk from those to which the substances mentioned by name in Table A of Chapter 3.2 belong, these mixtures shall be assigned to the entries to which they belong on the basis of their actual degree of danger.

NOTE: For the classification of solutions and mixtures (such as preparations and wastes) see also 2.1.3.

2.2.43.1.7 On the basis of the test procedures in accordance with the Manual of Tests and Criteria, Part III, Section 33.4, and the criteria set out in paragraph 2.2.43.1.5, it may also be determined whether the nature of a substance mentioned by name is such that the substance is not subject to the provisions for this Class.

Assignment of packing groups

2.2.43.1.8 Substances and articles classified under the various entries in Table A of Chapter 3.2 shall be assigned to packing groups I, II or III on the basis of test procedures of the Manual of Tests and Criteria, Part III, section 33.4, in accordance with the following criteria:

- (a) Packing group I shall be assigned to any substance which reacts vigorously with water at ambient temperature and generally demonstrates a tendency for the gas produced to ignite spontaneously, or one which reacts readily with water at ambient temperatures such that the rate of evolution of flammable gas is equal to or greater than 10 litres per kilogram of substance over any one minute period;
- (b) Packing group II shall be assigned to any substance which reacts readily with water at ambient temperature such that the maximum rate of evolution of flammable gas is equal to or greater than 20 litres per kilogram of substance per hour, and which does not meet the criteria of packing group I;
- (c) Packing group III shall be assigned to any substance which reacts slowly with water at ambient temperature such that the maximum rate of evolution of flammable gas is greater than 1 litre per kilogram of substance per hour, and which does not meet the criteria of packing groups I or II.

2.2.43.2 *Substances not accepted for carriage*

Water-reactive solids, oxidizing, assigned to UN No. 3133, shall not be accepted for carriage unless they meet the requirements for Class 1 (see also 2.1.3.7).

2.2.43.3 List of collective entries

Substances which, in contact with water, emit flammable gases	liquid	W1	1389 ALKALI METAL AMALGAM, LIQUID 1391 ALKALI METAL DISPERSION having a flash-point above 60 °C or 1391 ALKALINE EARTH METAL DISPERSION having a flash-point above 60 °C 1392 ALKALINE EARTH METAL AMALGAM, LIQUID 1420 POTASSIUM METAL ALLOYS, LIQUID 1421 ALKALI METAL ALLOY, LIQUID, N.O.S. 1422 POTASSIUM SODIUM ALLOYS, LIQUID 3398 ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE 3148 WATER-REACTIVE LIQUID, N.O.S.
	solid	W2 ^a	1390 ALKALI METAL AMIDES 3401 ALKALI METAL AMALGAM, SOLID 3402 ALKALINE EARTH METAL AMALGAM, SOLID 3170 ALUMINIUM SMELTING BY-PRODUCTS or 3170 ALUMINIUM REMELTING BY-PRODUCTS 3403 POTASSIUM METAL ALLOYS, SOLID 3404 POTASSIUM SODIUM ALLOYS, SOLID 1393 ALKALINE EARTH METAL ALLOY, N.O.S. 1409 METAL HYDRIDES, WATER-REACTIVE, N.O.S. 3208 METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S. 3395 ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE 2813 WATER-REACTIVE SOLID, N.O.S.
Without subsidiary risk	articles	W3	3292 BATTERIES, CONTAINING SODIUM or 3292 CELLS, CONTAINING SODIUM
W			1391 ALKALI METAL DISPERSION having a flash-point of not more than 60 °C or 1391 ALKALINE EARTH METAL DISPERSION having a flash-point of not more than 60 °C 3399 ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE
Liquid, flammable		WF1	3396 ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, FLAMMABLE 3132 WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.
Solid, flammable		WF2	3397 ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, SELF-HEATING 3209 METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S. 3135 WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.
Solid, self-heating		WS ^b	3133 WATER-REACTIVE SOLID, OXIDIZING, N.O.S. (not allowed, see 2.2.43.2)
Solid, oxidizing		WO	3130 WATER-REACTIVE LIQUID, TOXIC, N.O.S.
Toxic	liquid	WT1	3134 WATER-REACTIVE SOLID, TOXIC, N.O.S.
WT	solid	WT2	3129 WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.
Corrosive	liquid	WC1	3131 WATER-REACTIVE SOLID, CORROSIVE, N.O.S.
WC	solid	WC2	2988 CHLOROSILANES, WATER-REACTIVE, FLAMMABLE, CORROSIVE, NO.S. (No other collective entry with this classification code available, if need be, classification under a collective entry with a classification code to be determined according to the table of precedence of hazard in 2.1.3.10.)
Flammable, corrosive		WFC ^c	

^a Metals and metal alloys which, in contact with water, do not emit flammable gases and are not pyrophoric or self-heating, but which are readily flammable, are substances of Class 4.1. Alkaline-earth metals and alkaline-earth metal alloys in pyrophoric form are substances of Class 4.2. Dust and powders of metals in pyrophoric form are substances of Class 4.2. Metals and metal alloys in pyrophoric form are substances of Class 4.2. Compounds of phosphorus with heavy metals such as iron, copper, etc. are not subject to the provisions of ADN.

^b Metals and metal alloys in pyrophoric form are substances of Class 4.2.

^c Chlorosilanes, having a flash-point of less than 23 °C and which, in contact with water, do not emit flammable gases, are substances of Class 3. Chlorosilanes, having a flash-point equal to or greater than 23 °C and which, in contact with water, do not emit flammable gases, are substances of Class 8.

- 2.2.51 Class 5.1 Oxidizing substances**
- 2.2.51.1 Criteria**
- 2.2.51.1.1 The heading of Class 5.1 covers substances which, while in themselves not necessarily combustible, may, generally by yielding oxygen, cause or contribute to the combustion of other material, and articles containing such substances.
- 2.2.51.1.2 The substances of Class 5.1 and articles containing such substances are subdivided as follows:
- O Oxidizing substances without subsidiary risk or articles containing such substances:
 - O1 Liquid;
 - O2 Solid;
 - O3 Articles;
 - OF Oxidizing substances, solid, flammable;
 - OS Oxidizing substances, solid, self-heating;
 - OW Oxidizing substances, solid which, in contact with water, emit flammable gases;
 - OT Oxidizing substances, toxic:
 - OT1 Liquid;
 - OT2 Solid;
 - OC Oxidizing substances, corrosive:
 - OC1 Liquid;
 - OC2 Solid;
 - OTC Oxidizing substances, toxic, corrosive.
- 2.2.51.1.3 Substances and articles classified in Class 5.1 are listed in Table A of Chapter 3.2. The assignment of substances and articles not mentioned by name in Table A of Chapter 3.2 to the relevant entry of 2.2.51.3 in accordance with the provisions of Chapter 2.1 can be based on the tests, methods and criteria in paragraphs 2.2.51.1.6 to 2.2.51.1.9 below and the Manual of Tests and Criteria, Part III, Section 34.4. In the event of divergence between test results and known experience, judgement based on known experience shall take precedence over test results.
- 2.2.51.1.4 If substances of Class 5.1, as a result of admixtures, come into different categories of risk from those to which the substances mentioned by name in Table A of Chapter 3.2 belong, these mixtures or solutions shall be assigned to the entries to which they belong on the basis of their actual degree of danger.
- NOTE: For the classification of solutions and mixtures (such as preparations and wastes), see also Section 2.1.3.*
- 2.2.51.1.5 On the basis of the test procedures in the Manual of Tests and Criteria, Part III, Section 34.4 and the criteria set out in 2.2.51.1.6-2.2.51.1.9 it may also be determined whether the nature of a substance mentioned by name in Table A of Chapter 3.2 is such that the substance is not subject to the provisions for this class.

Oxidizing solids*Classification*

- 2.2.51.1.6 When oxidizing solid substances not mentioned by name in Table A of Chapter 3.2 are assigned to one of the entries listed in 2.2.51.3 on the basis of the test procedure in accordance with the Manual of Tests and Criteria, Part III, sub-section 34.4.1, the following criteria shall apply:

A solid substance shall be assigned to Class 5.1 if, in the 4:1 or the 1:1 sample-to-cellulose ratio (by mass) tested, it ignites or burns or exhibits mean burning times equal to or less than that of a 3:7 mixture (by mass) of potassium bromate and cellulose.

Assignment of packing groups

- 2.2.51.1.7 Oxidizing solids classified under the various entries in Table A of Chapter 3.2 shall be assigned to packing groups I, II or III on the basis of test procedures of the Manual of Tests and Criteria, Part III, sub-section 34.4.1, in accordance with the following criteria:

- (a) Packing group I: any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose;
- (b) Packing group II: any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose and the criteria for packing group I are not met;
- (c) Packing group III: any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose and the criteria for packing groups I and II are not met.

Oxidizing liquids*Classification*

- 2.2.51.1.8 When oxidizing liquid substances not mentioned by name in Table A of Chapter 3.2 are assigned to one of the entries listed in sub-section 2.2.51.3 on the basis of the test procedure in accordance with the Manual of Tests and Criteria, Part III, sub-section 34.4.2, the following criteria shall apply:

A liquid substance shall be assigned to Class 5.1 if, in the 1:1 mixture, by mass, of substance and cellulose tested, it exhibits a pressure rise of 2070 kPa gauge or more and a mean pressure rise time equal to or less than the mean pressure rise time of a 1:1 mixture, by mass, of 65% aqueous nitric acid and cellulose.

Assignment of packing groups

- 2.2.51.1.9 Oxidizing liquids classified under the various entries in Table A of Chapter 3.2 shall be assigned to packing groups I, II or III on the basis of test procedures of the Manual of Tests and Criteria, Part III, section 34.4.2, in accordance with the following criteria:

- (a) Packing group I: any substance which, in the 1:1 mixture, by mass, of substance and cellulose tested, spontaneously ignites; or the mean pressure rise time of a 1:1 mixture, by mass, of substance and cellulose is less than that of a 1:1 mixture, by mass, of 50% perchloric acid and cellulose;
- (b) Packing group II: any substance which, in the 1:1 mixture, by mass, of substance and cellulose tested, exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of 40% aqueous sodium chlorate solution and cellulose; and the criteria for packing group I are not met;
- (c) Packing group III: any substance which, in the 1:1 mixture, by mass, of substance and cellulose tested, exhibits a mean pressure rise time less than or equal to the mean pressure rise time of a 1:1 mixture, by mass, of 65% aqueous nitric acid and cellulose; and the criteria for packing groups I and II are not met.

2.2.51.2 *Substances not accepted for carriage*

2.2.51.2.1 The chemically unstable substances of Class 5.1 shall not be accepted for carriage unless the necessary steps have been taken to prevent their dangerous decomposition or polymerization during carriage. To this end it shall in particular be ensured that receptacles and tanks do not contain any material liable to promote these reactions.

2.2.51.2.2 The following substances and mixtures shall not be accepted for carriage:

- oxidizing solids, self-heating, assigned to UN No. 3100, oxidizing solids, water-reactive, assigned to UN No. 3121 and oxidizing solids, flammable, assigned to UN No. 3137, unless they meet the requirements for Class 1 (see also 2.1.3.7);
- hydrogen peroxide, not stabilized or hydrogen peroxide, aqueous solutions, not stabilized containing more than 60 % hydrogen peroxide;
- tetranitromethane not free from combustible impurities;
- perchloric acid solutions containing more than 72 % (mass) acid, or mixtures of perchloric acid with any liquid other than water;
- chloric acid solution containing more than 10 % chloric acid or mixtures of chloric acid with any liquid other than water;
- halogenated fluor compounds other than UN Nos. 1745 BROMINE PENTAFLUORIDE; 1746 BROMINE TRIFLUORIDE and 2495 IODINE PENTAFLUORIDE of Class 5.1 as well as UN Nos. 1749 CHLORINE TRIFLUORIDE and 2548 CHLORINE PENTAFLUORIDE of Class 2;
- ammonium chlorate and its aqueous solutions and mixtures of a chlorate with an ammonium salt;
- ammonium chlorite and its aqueous solutions and mixtures of a chlorite with an ammonium salt;
- mixtures of a hypochlorite with an ammonium salt;
- ammonium bromate and its aqueous solutions and mixtures of a bromate with an ammonium salt;

- ammonium permanganate and its aqueous solutions and mixtures of a permanganate with an ammonium salt;
- ammonium nitrate containing more than 0.2 % combustible substances (including any organic substance calculated as carbon) unless it is a constituent of a substance or article of Class 1;
- fertilizers having an ammonium nitrate content (in determining the ammonium nitrate content, all nitrate ions for which a molecular equivalent of ammonium ions is present in the mixture shall be calculated as ammonium nitrate) or a content in combustible substances exceeding the values specified in special provision 307 except under the conditions applicable to Class 1;
- ammonium nitrite and its aqueous solutions and mixtures of an inorganic nitrite with an ammonium salt;
- mixtures of potassium nitrate, sodium nitrite and an ammonium salt.

2.2.51.3 List of collective entries

Oxidizing substances	liquid	O1	3210 CHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S. 3211 PERCHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S. 3213 BROMATES, INORGANIC, AQUEOUS SOLUTION, N.O.S. 3214 PERMANGANATES, INORGANIC, AQUEOUS SOLUTION, N.O.S. 3216 PERSULPHATES, INORGANIC, AQUEOUS SOLUTION, N.O.S. 3218 NITRATES, INORGANIC, AQUEOUS SOLUTION, N.O.S. 3219 NITRITES, INORGANIC, AQUEOUS SOLUTION, N.O.S. 3139 OXIDIZING LIQUID, N.O.S.
			1450 BROMATES, INORGANIC, N.O.S 1461 CHLORATES, INORGANIC, N.O.S. 1462 CHLORITES, INORGANIC, N.O.S. 1477 NITRATES, INORGANIC, N.O.S 1481 PERCHLORATES, INORGANIC, N.O.S. 1482 PERMANGANATES, INORGANIC, N.O.S. 1483 PEROXIDES, INORGANIC, N.O.S 2627 NITRITES, INORGANIC, N.O.S. 3212 HYPOCHLORITES, INORGANIC, N.O.S. 3215 PERSULPHATES, INORGANIC, N.O.S. 1479 OXIDIZING SOLID, N.O.S.
Without subsidiary risk	solid	O2	3356 OXYGEN GENERATOR, CHEMICAL
O	articles	O3	3137 OXIDIZING SOLID, FLAMMABLE, N.O.S. (not allowed, see 2.2.51.2)
Solid, flammable		OF	3100 OXIDIZING SOLID, SELF-HEATING, N.O.S. (not allowed, see 2.2.51.2)
Solid, self-heating		OS	3121 OXIDIZING SOLID, WATER REACTIVE, N.O.S. (not allowed, see 2.2.51.2)
Solid, water reactive		OW	3099 OXIDIZING LIQUID, TOXIC, N.O.S.
Toxic	liquid	OT1	3087 OXIDIZING SOLID, TOXIC, N.O.S.
	solid	OT2	3098 OXIDIZING LIQUID, CORROSIVE, N.O.S.
Corrosive	liquid	OC1	3085 OXIDIZING SOLID, CORROSIVE, N.O.S.
	solid	OC2	(No collective entry with this classification code available; if need be, classification under a collective entry with a classification code to be determined according to the table of precedence of hazard in 2.1.3.10.)
Toxic, corrosive		OTC	

2.2.52 Class 5.2 Organic peroxides**2.2.52.1 Criteria**

2.2.52.1.1 The heading of Class 5.2 covers organic peroxides and formulations of organic peroxides.

2.2.52.1.2 The substances of Class 5.2 are subdivided as follows:

- P1 Organic peroxides, not requiring temperature control;
- P2 Organic peroxides, requiring temperature control.

Definition

2.2.52.1.3 *Organic peroxides* are organic substances which contain the bivalent -O-O- structure and may be considered derivatives of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals.

Properties

2.2.52.1.4 Organic peroxides are liable to exothermic decomposition at normal or elevated temperatures. The decomposition can be initiated by heat, contact with impurities (e.g. acids, heavy-metal compounds, amines), friction or impact. The rate of decomposition increases with temperature and varies with the organic peroxide formulation. Decomposition may result in the evolution of harmful, or flammable, gases or vapours. For certain organic peroxides the temperature shall be controlled during carriage. Some organic peroxides may decompose explosively, particularly if confined. This characteristic may be modified by the addition of diluents or by the use of appropriate packagings. Many organic peroxides burn vigorously. Contact of organic peroxides with the eyes is to be avoided. Some organic peroxides will cause serious injury to the cornea, even after brief contact, or will be corrosive to the skin.

NOTE: Test methods for determining the flammability of organic peroxides are set out in the Manual of Tests and Criteria, Part III, sub-section 32.4. Because organic peroxides may react vigorously when heated, it is recommended to determine their flash-point using small sample sizes such as described in ISO 3679:1983.

Classification

2.2.52.1.5 Any organic peroxide shall be considered for classification in Class 5.2 unless the organic peroxide formulation contains:

- (a) not more than 1.0 % available oxygen from the organic peroxides when containing not more than 1.0 % hydrogen peroxide;
- (b) not more than 0.5 % available oxygen from the organic peroxides when containing more than 1.0 % but not more than 7.0 % hydrogen peroxide.

NOTE: The available oxygen content (%) of an organic peroxide formulation is given by the formula

$$16 \times 3 (n_i \times c_i / m_i)$$

where:

- n_i = number of peroxygen groups per molecule of organic peroxide i ;
- c_i = concentration (mass %) of organic peroxide i ; and
- m_i = molecular mass of organic peroxide i .

2.2.52.1.6 Organic peroxides are classified into seven types according to the degree of danger they present. The types of organic peroxide range from type A, which is not accepted for carriage in the packaging in which it is tested, to type G, which is not subject to the provisions of Class 5.2. The classification of types B to F is directly related to the maximum quantity allowed in one packaging. The principles to be applied to the classification of substances not listed in 2.2.52.4 are set out in the Manual of Tests and Criteria, Part II.

2.2.52.1.7 Organic peroxides which have already been classified and are already permitted for carriage in packagings are listed in 2.2.52.4, those already permitted for carriage in IBCs are listed in 4.1.4.2 of ADR, packing instruction IBC520 and those already permitted for carriage in tanks in accordance with Chapters 4.2 and 4.3 of ADR are listed in 4.2.5.2 of ADR, portable tank instruction T23. Each permitted substance listed is assigned to a generic entry of Table A of Chapter 3.2 (UN Nos. 3101 to 3120) and appropriate subsidiary risks and remarks providing relevant transport information are given.

These generic entries specify:

- the type (B to F) of organic peroxide (see 2.2.52.1.6 above);
- physical state (liquid/solid); and
- temperature control (when required), see 2.2.52.1.15 to 2.2.52.1.18.

Mixtures of these formulations may be classified as the same type of organic peroxide as that of the most dangerous component and be carried under the conditions of carriage given for this type. However, as two stable components can form a thermally less stable mixture, the self-accelerating decomposition temperature (SADT) of the mixture shall be determined and, if necessary, the control and emergency temperatures derived from the SADT in accordance paragraph 2.2.52.1.16.

2.2.52.1.8 Classification of organic peroxides, formulations or mixtures of organic peroxides not listed in 2.2.52.4, 4.1.4.2 of ADR, packing instruction IBC520 or 4.2.5.2 of ADR, portable tank instruction T23, and assignment to a collective entry shall be made by the competent authority of the country of origin. The statement of approval shall contain the classification and the relevant conditions of carriage. If the country of origin is not a Contracting Party to ADN, the classification and conditions of carriage shall be recognized by the competent authority of the first country Contracting Party to ADN reached by the consignment.

2.2.52.1.9 Samples of organic peroxides or formulations of organic peroxides not listed in 2.2.52.4, for which a complete set of test results is not available and which are to be carried for further testing or evaluation, shall be assigned to one of the appropriate entries for organic peroxides type C provided the following conditions are met:

- the available data indicate that the sample would be no more dangerous than organic peroxides type B;
- the sample is packaged in accordance with packing method OP2 of 4.1.4.1 of ADR and the quantity per cargo transport unit is limited to 10 kg;
- the available data indicate that the control temperature, if any, is sufficiently low to prevent any dangerous decomposition and sufficiently high to prevent any dangerous phase separation.

Desensitization of organic peroxides

- 2.2.52.1.10 In order to ensure safety during carriage, organic peroxides are in many cases desensitized by organic liquids or solids, inorganic solids or water. Where a percentage of a substance is stipulated, this refers to the percentage by mass, rounded to the nearest whole number. In general, desensitization shall be such that, in case of spillage, the organic peroxide will not concentrate to a dangerous extent.
- 2.2.52.1.11 Unless otherwise stated for the individual organic peroxide formulation, the following definition(s) shall apply to diluents used for desensitization:
- diluents type A are organic liquids which are compatible with the organic peroxide and which have a boiling point of not less than 150 °C. Type A diluents may be used for desensitizing all organic peroxides.
 - diluents type B are organic liquids which are compatible with the organic peroxide and which have a boiling point of less than 150 °C but not less than 60 °C and a flash-point of not less than 5 °C.
- Type B diluents may be used for desensitization of all organic peroxides provided that the boiling point of the liquid is at least 60 °C higher than the SADT in a 50 kg package.
- 2.1.52.1.12 Diluents, other than type A or type B, may be added to organic peroxide formulations as listed in 2.2.52.4 provided that they are compatible. However, replacement of all or part of a type A or type B diluent by another diluent with differing properties requires that the organic peroxide formulation be re-assessed in accordance with the normal acceptance procedure for Class 5.2.
- 2.2.52.1.13 Water may only be used for the desensitization of organic peroxides which are listed in 2.2.52.4 or in the competent authority decision according to 2.2.52.1.8 as being "with water" or "as a stable dispersion in water". Samples of organic peroxides or formulations of organic peroxides not listed in 2.2.52.4 may also be desensitized with water provided the requirements of 2.2.52.1.9 are met.
- 2.2.52.1.14 Organic and inorganic solids may be used for desensitization of organic peroxides provided that they are compatible. Compatible liquids and solids are those which have no detrimental influence on the thermal stability and hazard type of the organic peroxide formulation.

Temperature control requirements

- 2.2.52.1.15 Certain organic peroxides may only be carried under temperature-controlled conditions. The control temperature is the maximum temperature at which the organic peroxide can be safely carried. It is assumed that the temperature of the immediate surroundings of a package only exceeds 55 °C during carriage for a relatively short time in a 24 hour period. In the event of loss of temperature control, it may be necessary to implement emergency procedures. The emergency temperature is the temperature at which such procedures shall be implemented.
- 2.2.52.1.16 The control and emergency temperatures are derived from the SADT which is defined as the lowest temperature at which self-accelerating decomposition may occur with a substance in the packaging as used during carriage (see Table 1). The SADT shall be determined in order to decide whether a substance shall be subjected to temperature control during carriage. Provisions for the determination of the SADT are given in the Manual of Tests and Criteria, Part II, Sections 20 and 28.4.

Table 1: Derivation of control and emergency temperatures

Type of receptacle	SADT ^a	Control temperature	Emergency temperature
Single packagings and IBCs	20 °C or less	20 °C below SADT	10 °C below SADT
	over 20 °C to 35 °C	15 °C below SADT	10 °C below SADT
	over 35 °C	10 °C below SADT	5 °C below SADT
Tanks	Not greater than 50 °C	10 °C below SADT	5 °C below SADT

^a SADT of the substance as packaged for carriage.

2.2.52.1.17 The following organic peroxides shall be subject to temperature control during carriage:

- organic peroxides types B and C with an SADT ≤ 50 °C;
- organic peroxides type D showing a medium effect when heated under confinement with an SADT ≤ 50 °C or showing a low or no effect when heated under confinement with an SADT ≤ 45 °C; and
- organic peroxides types E and F with an SADT ≤ 45 °C.

NOTE: Provisions for the determination of the effects of heating under confinement are given in the Manual of Tests and Criteria, Part II, Section 20 and Sub-section 28.4.

2.2.52.1.18 Where applicable, control and emergency temperatures are listed in 2.2.52.4. The actual temperature during carriage may be lower than the control temperature but shall be selected so as to avoid dangerous separation of phases.

2.2.52.2 Substances not accepted for carriage

Organic peroxides, type A, shall not be accepted for carriage under the provisions of Class 5.2 (see Manual of Tests and Criteria, Part II, paragraph 20.4.3 (a)).

2.2.52.3 *List of collective entries*

Organic peroxides		ORGANIC PEROXIDE TYPE A, LIQUID	}	Not accepted for carriage, see 2.2.52.2	
		ORGANIC PEROXIDE TYPE A, SOLID			
		3101	ORGANIC PEROXIDE TYPE B, LIQUID		
		3102	ORGANIC PEROXIDE TYPE B, SOLID		
		3103	ORGANIC PEROXIDE TYPE C, LIQUID		
		3104	ORGANIC PEROXIDE TYPE C, SOLID		
	Not requiring temperature control	P1	3105	ORGANIC PEROXIDE TYPE D, LIQUID	
			3106	ORGANIC PEROXIDE TYPE D, SOLID	
			3107	ORGANIC PEROXIDE TYPE E, LIQUID	
			3108	ORGANIC PEROXIDE TYPE E, SOLID	
		3109	ORGANIC PEROXIDE TYPE F, LIQUID		
		3110	ORGANIC PEROXIDE TYPE F, SOLID		
			ORGANIC PEROXIDE TYPE G, LIQUID	} Not subject to the provisions applicable to Class 5.2, see 2.2.52.1.6	
			ORGANIC PEROXIDE TYPE G, SOLID		
Requiring temperature control	P2	3111	ORGANIC PEROXIDE TYPE B, LIQUID, TEMPERATURE CONTROLLED		
		3112	ORGANIC PEROXIDE TYPE B, SOLID, TEMPERATURE CONTROLLED		
		3113	ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED		
		3114	ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED		
		3115	ORGANIC PEROXIDE TYPE D, LIQUID, TEMPERATURE CONTROLLED		
		3116	ORGANIC PEROXIDE TYPE D, SOLID, TEMPERATURE CONTROLLED		
		3117	ORGANIC PEROXIDE TYPE E, LIQUID, TEMPERATURE CONTROLLED		
		3118	ORGANIC PEROXIDE TYPE E, SOLID, TEMPERATURE CONTROLLED		
		3119	ORGANIC PEROXIDE TYPE F, LIQUID, TEMPERATURE CONTROLLED		
		3120	ORGANIC PEROXIDE TYPE F, SOLID, TEMPERATURE CONTROLLED		

2.2.52.4 *List of currently assigned organic peroxides in packagings*

In the column "Packing Method", codes "OP1" to "OP8" refer to packing methods in 4.1.4.1 of ADR packing instruction P520 (see also 4.1.7.1 of ADR). Organic peroxides to be carried shall fulfill the classification and the control and emergency temperatures (derived from the SADT) as listed. For substances permitted in IBCs, see 4.1.4.2 of ADR, packing instruction IBC520 and, for those permitted in tanks according to Chapters 4.2 and 4.3 of ADR, see 4.2.5.2 of ADR, portable tank instruction T23.

ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%) 1)	Inert solid (%)	Water	Packing Method	Control temperature (°C)	Emergency temperature (°C)	Number (Generic entry)	Subsidiary risks and remarks
ACETYL ACETONE PEROXIDE	≤ 42	≥ 48			≥ 8	OP7			3105	2)
"	≤ 32 as a paste					OP7			3106	20)
ACETYL CYCLOHEXANESULFONYL PEROXIDE	≤ 82				≥ 12	OP4	-10	0	3112	3)
"	≤ 32		≥ 68			OP7	-10	0	3115	
tert-AMYL HYDROPEROXIDE	≤ 88	≥ 6			≥ 6	OP8			3107	
tert-AMYL PEROXYACETATE	≤ 62	≥ 38				OP7			3105	
tert-AMYL PEROXYBENZOATE	≤ 100					OP5			3103	
tert-AMYL PEROXY-2-ETHYLHEXANOATE	≤ 100					OP7	+20	+25	3115	
tert-AMYL PEROXY-2-ETHYLHEXYL CARBONATE	≤ 100					OP7			3105	
tert-AMYL PEROXY ISOPROPYL CARBONATE	≤ 77	≥ 23				OP5			3103	
tert-AMYL PEROXYNEODECANOATE	≤ 77	≥ 23	≥ 23			OP7	0	+10	3115	
"	≤ 47	≥ 53				OP8	0	+10	3119	
tert-AMYL PEROXYPIVALATE	≤ 77		≥ 23			OP5	+10	+15	3113	
tert-AMYL PEROXY-3,5,5-TRIMETHYLHEXANOATE	≤ 100					OP7			3105	3)
tert-BUTYL CUMYL PEROXIDE	> 42 – 100					OP8			3107	
"	≤ 52			≥ 48		OP8			3108	
n-BUTYL-4,4-DI-(tert-BUTYLPEROXY)VALERATE	> 52 – 100			≥ 48		OP5			3103	
"	≤ 52			≥ 48		OP8			3108	
tert-BUTYL HYDROPEROXIDE	> 79 – 90				≥ 10	OP5			3103	13)
"	≤ 80	≥ 20				OP7			3105	4) 13)
"	≤ 79				> 14	OP8			3107	13) 23)
"	≤ 72				≥ 28	OP8			3109	13)
tert-BUTYL HYDROPEROXIDE + DI-tert-BUTYL PEROXIDE	< 82 + > 9				≥ 7	OP5			3103	13)
tert-BUTYL MONOPEROXYMALEATE	> 52 – 100					OP5			3102	3)
"	≤ 52	≥ 48				OP6			3103	
"	≤ 52			≥ 48		OP8			3108	
"	≤ 52 as a paste					OP8			3108	
tert-BUTYL PEROXYACETATE	> 52 – 77	≥ 23				OP5			3101	3)
"	> 32 – 52	≥ 48				OP6			3103	
"	≤ 32		≥ 68			OP8			3109	
tert-BUTYL PEROXYBENZOATE	> 77 – 100					OP5			3103	
"	> 52 - 77	≥ 23				OP7			3105	
"	≤ 52			≥ 48		OP7			3106	
tert-BUTYL PEROXYBUTYL FUMARATE	≤ 52	≥ 48				OP7			3105	

ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%) 1)	Inert solid (%)	Water	Packing Method	Control temperature (°C)	Emergency temperature (°C)	Number (Generic entry)	Subsidiary risks and remarks
tert-BUTYL PEROXYCROTONATE	≤ 77	≥ 23				OP7			3105	
tert-BUTYL PEROXYDIETHYLACETATE	≤ 100					OP5	+20	+25	3113	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE	> 52 – 100					OP6	+20	+25	3113	
"	> 32 – 52		≥ 48			OP8	+30	+35	3117	
"	≤ 52			≥ 48		OP8	+20	+25	3118	
"	≤ 32		≥ 68			OP8	+40	+45	3119	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE + 2,2-DI-(tert-BUTYLPEROXY)BUTANE	≤ 12 + ≤ 14	≥ 14		≥ 60		OP7			3106	
"	≤ 31 + ≤ 36		≥ 33			OP7	+35	+40	3115	
tert-BUTYL PEROXY-2-ETHYLHEXYLCARBONATE	≤ 100					OP7			3105	
tert-BUTYL PEROXYISOBUTYRATE	> 52 – 77		≥ 23			OP5	+15	+20	3111	3)
"	≤ 52		≥ 48			OP7	+15	+20	3115	
tert-BUTYLPEROXY ISOPROPYLCARBONATE	≤ 77	≥ 23				OP5			3103	
1-(2-tert-BUTYLPEROXY ISOPROPYL)-3-ISOPROPENYLBENZENE	≤ 77	≥ 23				OP7			3105	
tert-BUTYL PEROXY-2-METHYLBENZOATE	≤ 100			≥ 58		OP8			3108	
tert-BUTYL PEROXYNEODECANOATE	> 77 – 100					OP5			3103	
"	≤ 77		≥ 23			OP7	-5	+5	3115	
"	≤ 52 as a stable dispersion in water					OP7	0	+10	3115	
"	≤ 42 as a stable dispersion in water (frozen)					OP8	0	+10	3119	
"	≤ 32	≥ 68				OP8	0	+10	3118	
tert-BUTYL PEROXYNEOHEPTANOATE	≤ 77	≥ 23				OP7	0	+10	3115	
"	≤ 42 as a stable dispersion in water					OP8	0	+10	3117	
tert-BUTYL PEROXYPIVALATE	> 67 - 77	≥ 23				OP5	0	+10	3113	
"	> 27 – 67		≥ 33			OP7	0	+10	3115	
"	≤ 27		≥ 73			OP8	+30	+35	3119	
tert-BUTYLPEROXY STEARYLCARBONATE	≤ 100					OP7			3106	
tert-BUTYL PEROXY-3,5,5-TRIMETHYLHEXANOATE	> 32 – 100					OP7			3105	
"	≤ 42			≥ 58		OP7			3106	
"	≤ 32		≥ 68			OP8			3109	

ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (% 1)	Inert solid (%)	Water	Packing Method	Control temperature (°C)	Emergency temperature (°C)	Number (Generic entry)	Subsidiary risks and remarks
3-CHLOROPEROXYBENZOIC ACID	> 57 – 86			≥ 14		OP1			3102	3)
"	≤ 57			≥ 3	≥ 40	OP7			3106	
"	≤ 77			≥ 6	≥ 17	OP7			3106	
CUMYL HYDROPEROXIDE	> 90 – 98	≤ 10				OP8			3107	13)
"	≤ 90	≥ 10				OP8			3109	13) 18)
CUMYL PEROXYNEODECANOATE	≤ 87	≥ 13				OP7	-10	0	3115	
"	≤ 77		≥ 23			OP7	-10	0	3115	
"	≤ 52 as a stable dispersion in water					OP8	-10	0	3119	
CUMYL PEROXYNEOHEPTANOATE	≤ 77	≥ 23				OP7	-10	0	3115	
CUMYL PEROXYPIVALATE	≤ 77		≥ 23			OP7	-5	+5	3115	
CYCLOHEXANONE PEROXIDE(S)	≤ 91				≥ 9	OP6			3104	13)
"	≤ 72	≥ 28				OP7			3105	5)
"	≤ 72 as a paste					OP7			3106	5) 20)
"	≤ 32			≥ 68					Exempt	29)
DIACETONE ALCOHOL PEROXIDES	≤ 57		≥ 26		≥ 8	OP7	+40	+45	3115	6)
DIACETYL PEROXIDE	≤ 27		≥ 73			OP7	+20	+25	3115	7) 13)
DI-tert-AMYL PEROXIDE	≤ 100					OP8			3107	
2,2-DI-(tert-AMYLPEROXY)BUTANE	≤ 57	≥ 43				OP7			3105	
1,1-DI-(tert-AMYLPEROXY)CYCLOHEXANE	≤ 82	≥ 18				OP6			3103	
DIBENZOYL PEROXIDE	> 51 - 100			≤ 48		OP2			3102	3)
"	> 77 - 94				≥ 6	OP4			3102	3)
"	≤ 77				≥ 23	OP6			3104	
"	≤ 62			≥ 28	≥ 10	OP7			3106	
"	> 52 – 62 as a paste					OP7			3106	20)
"	> 35 – 52			≥ 48		OP7			3106	
"	> 36 – 42	≥ 18			≤ 40	OP8			3107	
"	≤ 56,5 as a paste				≥ 15	OP8			3108	
"	≤ 52 as a paste					OP8			3108	20)
"	≤ 42 as a stable dispersion in water					OP8			3109	
"	≤ 35			≥ 65					Exempt	29)
DI-(4-tert-BUTYL)CYCLOHEXYL PEROXYDICARBONATE	≤ 100					OP6	+30	+35	3114	
"	≤ 42 as a stable dispersion in water					OP8	+30	+35	3119	

ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%) 1)	Inert solid (%)	Water	Packing Method	Control temperature (°C)	Emergency temperature (°C)	Number (Generic entry)	Subsidiary risks and remarks
DI-tert-BUTYL PEROXIDE	> 52 - 100					OP8			3107	
"	≤ 52		≥ 48			OP8			3109	25)
DI-tert-BUTYL PEROXYAZELATE	≤ 52	≥ 48				OP7			3105	
2,2-DI-(tert-BUTYLPEROXY)BUTANE	≤ 52	≥ 48				OP6			3103	
1,6-DI-(tert-BUTYLPEROXYCARBONYLOXY)HEXANE	≤ 72	≥ 28				OP5			3103	
1,1-DI-(tert-BUTYLPEROXY)CYCLOHEXANE	> 80 - 100					OP5			3101	3)
"	≤ 72		≥ 28			OP5			3103	30)
"	> 52 - 80	≥ 20				OP5			3103	
"	> 42 - 52	≥ 48				OP7			3105	
"	≤ 42	≥ 13		≥ 45		OP7			3106	
"	≤ 42	≥ 58				OP8			3109	
"	≤ 27	≥ 25				OP8			3107	21)
"	≤ 13	≥ 13	≥ 74			OP8			3109	
1,1-DI-(tert-BUTYLPEROXY)CYCLOHEXANE + tert-BUTYL PEROXY-2-ETHYLHEXANOATE	≤ 43 + ≤ 16	≥ 41				OP 7			3105	
DI-n-BUTYL PEROXYDICARBONATE	> 27 - 52		≥ 48			OP7	-15	-5	3115	
"	≤ 27		≥ 73			OP8	-10	0	3117	
"	≤ 42 as a stable dispersion in water (frozen)					OP8	-15	-5	3118	
DI-sec-BUTYL PEROXYDICARBONATE	> 52 - 100					OP4	-20	-10	3113	
"	≤ 52		≥ 48			OP7	-15	-5	3115	
DI-(2-tert-BUTYLPEROXYISOPROPYL)BENZENE(S)	> 42 - 100			≤ 57		OP7			3106	29)
"	≤ 42			≥ 58					Exempt	
DI-(tert-BUTYLPEROXY) PHTHALATE	> 42 - 52	≥ 48				OP7			3105	
"	≤ 52 as a paste					OP7			3106	20)
"	≤ 42	≥ 58				OP8			3107	
2,2-DI-(tert-BUTYLPEROXY)PROPANE	≤ 52	≥ 48				OP7			3105	
"	≤ 42	≥ 13		≥ 45		OP7			3106	

ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%) 1)	Inert solid (%)	Water	Packing Method	Control temperature (°C)	Emergency temperature (°C)	Number (Generic entry)	Subsidiary risks and remarks
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYLCYCLOHEXANE	> 90 - 100					OP5			3101	3)
"	≤ 90		≥ 10			OP5			3103	30)
"	> 57 - 90	≥ 10				OP5			3103	
"	≤ 77		≥ 23			OP5			3103	
"	≤ 57			≥ 43		OP8			3110	
"	≤ 57	≥ 43				OP8			3107	
"	≤ 32	≥ 26	≥ 42			OP8			3107	
DICETYL PEROXYDICARBONATE	≤ 100					OP7	+30	+35	3116	
"	≤ 42 as a stable dispersion in water					OP8	+30	+35	3119	
DI-4-CHLOROBENZOYL PEROXIDE	≤ 77				≥ 23	OP5			3102	3)
"	≤ 52 as a paste					OP7			3106	20)
"	≤ 32			≥ 68					Exempt	29)
DICUMYL PEROXIDE	> 52 - 100					OP8			3110	12)
"	≤ 52			≥ 48					Exempt	29)
DICYCLOHEXYL PEROXYDICARBONATE	> 91 - 100					OP3	+10	+15	3112	3)
"	≤ 91				≥ 9	OP5	+10	+15	3114	
"	≤ 42 as a stable dispersion in water					OP8	+15	+20	3119	
DIDECANOYL PEROXIDE	≤ 100					OP6	+30	+35	3114	
2,2-DI-(4,4-DI (tert-BUTYLPEROXY) CYCLOHEXYL) PROPANE	≤ 42			≥ 58		OP7			3106	
"	≤ 22		≥ 78			OP8			3107	
DI-(2,4-DICHLOROBENZOYL PEROXIDE	≤ 77				≥ 23	OP5			3102	3)
"	≤ 52 as a paste					OP8	+20	+25	3118	
"	≤ 52 as a paste with silicon oil					OP7			3106	
DI-(2-ETHOXYETHYL) PEROXYDICARBONATE	≤ 52		≥ 48			OP7	-10	0	3115	
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE	> 77 - 100					OP5	-20	-10	3113	
"	≤ 77		≥ 23			OP7	-15	-5	3115	
"	≤ 62 as a stable dispersion in water					OP8	-15	-5	3119	
"	≤ 52 as a stable dispersion in water (frozen)					OP8	-15	-5	3120	
2,2-DIHYDROPEROXYPROPANE	≤ 27			≥ 73		OP5			3102	3)

ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (% (1))	Inert solid (%)	Water	Packing Method	Control temperature (°C)	Emergency temperature (°C)	Number (Generic entry)	Subsidiary risks and remarks
DI-(1-HYDROXYCYCLOHEXYL) PEROXIDE	≤ 100					OP7			3106	
DIISOBUTYRYL PEROXIDE	> 32 – 52		≥ 48			OP5	-20	-10	3111	3)
"	≤ 32		≥ 68			OP7	-20	-10	3115	
DIISOPROPYLBENZENE DIHYDROPEROXIDE	≤ 82	≥ 5			≥ 5	OP7			3106	24)
DIISOPROPYL PEROXYDICARBONATE	> 52-100					OP2	-15	-5	3112	3)
"	≤ 52		≥ 48			OP7	-20	-10	3115	
"	≤ 28	≥ 72				OP7	-15	-5	3115	
DILAUROYL PEROXIDE	≤ 100					OP7			3106	
"	≤ 42 as a stable dispersion in water					OP8			3109	
DI-(3-METHOXYBUTYL) PEROXYDICARBONATE	≤ 52		≥ 48			OP7	-5	+5	3115	
DI-(2-METHYLBENZOYL) PEROXIDE	≤ 87				≥ 13	OP5	+30	+35	3112	3)
DI-(3-METHYLBENZOYL) PEROXIDE + BENZOYL (3-METHYLBENZOYL) PEROXIDE + DIBENZOYL PEROXIDE	≤ 20 + ≤ 18 + ≤ 4		≥ 58			OP7	+35	+40	3115	
DI-(4-METHYLBENZOYL) PEROXIDE	≤ 52 as a paste with silicon oil					OP7			3106	
2,5-DIMETHYL-2,5-DI-(BENZOYLPEROXY)HEXANE	> 82-100					OP5			3102	3)
"	≤ 82			≥ 18		OP7			3106	
"	≤ 82				≥ 18	OP5			3104	
2,5-DIMETHYL-2,5-DI-(tert-BUTYLPEROXY)HEXANE	> 52 – 100					OP7			3105	
"	≤ 77			≥ 23		OP8			3108	
"	≤ 52	≥ 48				OP8			3109	
"	≤ 47 as a paste					OP8			3108	
2,5-DIMETHYL-2,5-DI-(tert-BUTYLPEROXY)HEXYNE-3	> 86-100					OP5			3101	3)
"	> 52-86	≥ 14				OP5			3103	26)
"	≤ 52			≥ 48		OP7			3106	
2,5-DIMETHYL-2,5-DI-(2-ETHYLHEXANOYLPEROXY)HEXANE	≤ 100					OP5	+20	+25	3113	
2,5-DIMETHYL-2,5-DIHYDROPEROXYHEXANE	≤ 82				≥ 18	OP6			3104	
2,5-DIMETHYL-2,5-DI-(3,5,5-TRIMETHYLHEXANOYLPEROXY)HEXANE	≤ 77	≥ 23				OP7			3105	
1,1-DIMETHYL-3-HYDROXYBUTYL PEROXYNEOHEPTANOATE	≤ 52	≥ 48				OP8	0	+10	3117	

ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%) 1)	Inert solid (%)	Water	Packing Method	Control temperature (°C)	Emergency temperature (°C)	Number (Generic entry)	Subsidiary risks and remarks
DIMYRISTYL PEROXYDICARBONATE	≤ 100					OP7	+20	+25	3116	
"	≤ 42 as a stable dispersion in water					OP8	+20	+25	3119	
DI-(2-NEODECANOYLPEROXYISOPROPYL) BENZENE	≤ 52	≥ 48				OP7	-10	0	3115	
DI-n-NONANOYL PEROXIDE	≤ 100					OP7	0	+10	3116	
DI-n-OCTANOYL PEROXIDE	≤ 100					OP5	+10	+15	3114	
DI-(2-PHENOXYETHYL) PEROXYDICARBONATE	>85 – 100					OP5			3102	3)
"	≤ 85				≥ 15	OP7			3106	
DIPROPIONYL PEROXIDE	≤ 27		≥ 73			OP8	+15	+20	3117	
DI-n-PROPYL PEROXYDICARBONATE	≤ 100					OP3	-25	-15	3113	
"	≤ 77		≥ 23			OP5	-20	-10	3113	
DISUCCINIC ACID PEROXIDE	> 72 – 100					OP4			3102	3) 17)
"	≤ 72				≥ 28	OP7	+10	+15	3116	
DI-(3,5,5-TRIMETHYLHEXANOYL) PEROXIDE	> 38-82	≥ 18				OP7	0	+10	3115	
"	≤ 52 as a stable dispersion in water					OP8	+10	+15	3119	
"	≤ 38	≥ 62				OP8	+20	+25	3119	
ETHYL 3,3-DI-(tert-AMYLPEROXY)BUTYRATE	≤ 67	≥ 33				OP7			3105	
ETHYL 3,3-DI-(tert-BUTYLPEROXY)BUTYRATE	> 77 - 100					OP5			3103	
"	≤ 77	≥ 23				OP7			3105	
"	≤ 52			≥ 48		OP7			3106	
1-(2-ETHYLHEXANOYLPEROXY)-1,3-DIMETHYLBUTYL PEROXYPIVALATE	≤ 52	≥ 45	≥ 10			OP7	-20	-10	3115	
tert-HEXYL PEROXYNEODECANOATE	≤ 71	≥ 29				OP7	0	+10	3115	
tert-HEXYL PEROXYPIVALATE	≤ 72		≥ 28			OP7	+10	+15	3115	
3-HYDROXY-1,1-DIMETHYLBUTYL PEROXYNEODECANOATE	≤ 77	≥ 23				OP7	-5	+5	3115	
"	≤ 52	≥ 48				OP8	-5	+5	3117	
"	≤ 52 as a stable dispersion in water					OP8	-5	+5	3119	
ISOPROPYL sec-BUTYL PEROXYDICARBONATE +DI-sec-BUTYL PEROXYDICARBONATE +DI-ISOPROPYL PEROXYDICARBONATE	≤ 32 + ≤ 15 – 18 ≤ 12 – 15	≥ 38				OP7	-20	-10	3115	
"	≤ 52 + ≤ 28 + ≤ 22					OP5	-20	-10	3111	3)
ISOPROPYLCUMYL HYDROPEROXIDE	≤ 72	≥ 28				OP8			3109	13)

ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%) 1)	Inert solid (%)	Water	Packing Method	Control temperature (°C)	Emergency temperature (°C)	Number (Generic entry)	Subsidiary risks and remarks
p-MENTHYL HYDROPEROXIDE	> 72 - 100					OP7			3105	13)
"	≤ 72	≥ 28				OP8			3109	27)
METHYLCYCLOHEXANONE PEROXIDE(S)	≤ 67		≥ 33			OP7	+35	+40	3115	
METHYL ETHYL KETONE PEROXIDE(S)	see remark 8)	≥ 48				OP5			3101	3) 8) 13)
"	see remark 9)	≥ 55				OP7			3105	9)
"	see remark 10)	≥ 60				OP8			3107	10)
METHYL ISOBUTYL KETONE PEROXIDE(S)	≤ 62	≥ 19				OP7			3105	22)
METHYL ISOPROPYL KETONE PEROXIDE(S)	See remark 31)	≥ 70				OP8			3109	31)
ORGANIC PEROXIDE, LIQUID, SAMPLE						OP2			3103	11)
ORGANIC PEROXIDE, LIQUID, SAMPLE, TEMPERATURE CONTROLLED						OP2			3113	11)
ORGANIC PEROXIDE, SOLID, SAMPLE						OP2			3104	11)
ORGANIC PEROXIDE, SOLID, SAMPLE, TEMPERATURE CONTROLLED						OP2			3114	11)
3,3,5,7,7-PENTAMETHYL-1,2,4-TRIOXEPANE	≤ 100					OP8			3107	
PEROXYACETIC ACID, TYPE D, stabilized	≤ 43					OP7			3105	13) 14) 19)
PEROXYACETIC ACID, TYPE E, stabilized	≤ 43					OP8			3107	13) 15) 19)
PEROXYACETIC ACID, TYPE F, stabilized	≤ 43					OP8			3109	13) 16) 19)
PEROXYLAURIC ACID	≤ 100					OP8	+35	+40	3118	
PINANYL HYDROPEROXIDE	> 56 - 100					OP7			3105	13)
"	≤ 56	≥ 44				OP8			3109	
POLYETHER POLY-tert-BUTYLPEROXY-CARBONATE	≤ 52		≥ 48			OP8			3107	
1,1,3,3-TETRAMETHYLBUTYL HYDROPEROXIDE	≤ 100					OP7			3105	
1,1,3,3-TETRAMETHYLBUTYL PEROXY-2-ETHYLHEXANOATE	≤ 100					OP7	+15	+20	3115	
1,1,3,3-TETRAMETHYLBUTYL PEROXYNEODECANOATE	≤ 72		≥ 28			OP7	-5	+5	3115	
"	≤ 52 as a stable dispersion in water					OP8	-5	+5	3119	
1,1,3,3-TETRAMETHYLBUTYL PEROXYPIVALATE	≤ 77	≥ 23				OP7	0	+10	3115	
3,6,9-TRIETHYL-3,6,9-TRIMETHYL-1,4,7 TRIPEROXANE	≤ 42	≥ 58				OP7			3105	28)

Remarks (refer to the last column of the Table in 2.2.52.4):

- 1) Diluent type B may always be replaced by diluent type A. The boiling point of diluent type B shall be at least 60°C higher than the SADT of the organic peroxide.
- 2) Available oxygen $\leq 4.7\%$.
- 3) "EXPLOSIVE" subsidiary risk label required (Model No.1, see 5.2.2.2.2).
- 4) Diluent may be replaced by di-tert-butyl peroxide.
- 5) Available oxygen $\leq 9\%$.
- 6) With $\leq 9\%$ hydrogen peroxide; available oxygen $\leq 10\%$.
- 7) Only non-metallic packagings allowed.
- 8) Available oxygen $> 10\%$ and $\leq 10.7\%$, with or without water.
- 9) Available oxygen $\leq 10\%$, with or without water.
- 10) Available oxygen $\leq 8.2\%$, with or without water.
- 11) See 2.2.52.1.9.
- 12) Up to 2000 kg per receptacle assigned to ORGANIC PEROXIDE TYPE F on the basis of large scale trials.
- 13) "CORROSIVE" subsidiary risk label required (Model No.8, see 5.2.2.2.2).
- 14) Peroxyacetic acid formulations which fulfil the criteria of the Manual of Tests and Criteria, paragraph 20.4.3 (d).
- 15) Peroxyacetic acid formulations which fulfil the criteria of the Manual of Tests and Criteria, paragraph 20.4.3 (e).
- 16) Peroxyacetic acid formulations which fulfil the criteria of the Manual of Tests and Criteria, paragraph 20.4.3 (f).
- 17) Addition of water to this organic peroxide will decrease its thermal stability.
- 18) No "CORROSIVE" subsidiary risk label (Model No.8, see 5.2.2.2.2) required for concentrations below 80%.
- 19) Mixtures with hydrogen peroxide, water and acid(s).
- 20) With diluent type A, with or without water.
- 21) With $\geq 25\%$ diluent type A by mass, and in addition ethylbenzene.
- 22) With $\geq 19\%$ diluent type A by mass, and in addition methyl isobutyl ketone.
- 23) With $< 6\%$ di-tert-butyl peroxide.
- 24) With $\leq 8\%$ 1-isopropylhydroperoxy-4-isopropylhydroxybenzene.
- 25) Diluent type B with boiling point > 110 °C.
- 26) With $< 0.5\%$ hydroperoxides content.
- 27) For concentrations more than 56%, "CORROSIVE" subsidiary risk label required (Model No.8, see 5.2.2.2.2).
- 28) Available active oxygen $\leq 7.6\%$ in diluent type A having a 95% boil-off point in the range of 200 - 260 °C.
- 29) Not subject to the requirements of ADN for Class 5.2.
- 30) Diluent type B with boiling point > 130 °C.
- 31) Active oxygen $\leq 6.7\%$.

2.2.61 Class 6.1 Toxic substances**2.2.61.1 Criteria**

2.2.61.1.1 The heading of Class 6.1 covers substances of which it is known by experience or regarding which it is presumed from experiments on animals that in relatively small quantities they are able by a single action or by action of short duration to cause damage to human health, or death, by inhalation, by cutaneous absorption or by ingestion.

2.2.61.1.2 Substances of Class 6.1 are subdivided as follows:

T Toxic substances without subsidiary risk:

- T1 Organic, liquid;
- T2 Organic, solid;
- T3 Organometallic substances;
- T4 Inorganic, liquid;
- T5 Inorganic, solid;
- T6 Liquid, used as pesticides;
- T7 Solid, used as pesticides;
- T8 Samples;
- T9 Other toxic substances;

TF Toxic substances, flammable:

- TF1 Liquid;
- TF2 Liquid, used as pesticides;
- TF3 Solid;

TS Toxic substances, self-heating, solid;

TW Toxic substances, which, in contact with water, emit flammable gases:

- TW1 Liquid;
- TW2 Solid;

TO Toxic substances, oxidizing:

- TO1 Liquid;
- TO2 Solid;

TC Toxic substances, corrosive:

- TC1 Organic, liquid;
- TC2 Organic, solid;
- TC3 Inorganic, liquid;
- TC4 Inorganic, solid;

TFC Toxic substances, flammable, corrosive.

Definitions

2.2.61.1.3 For the purposes of ADN:

LD₅₀ (median lethal dose) for acute oral toxicity is the statistically derived single dose of a substance that can be expected to cause death within 14 days in 50 per cent of young adult

albino rats when administered by the oral route. The LD₅₀ value is expressed in terms of mass of test substance per mass of test animal (mg/kg);

LD₅₀ for acute dermal toxicity is that dose of the substance which, administered by continuous contact for 24 hours with the bare skin of albino rabbits, is most likely to cause death within 14 days in one half of the animals tested. The number of animals tested shall be sufficient to give a statistically significant result and be in conformity with good pharmacological practice. The result is expressed in milligrams per kg body mass;

LC₅₀ for acute toxicity on inhalation is that concentration of vapour, mist or dust which, administered by continuous inhalation to both male and female young adult albino rats for one hour, is most likely to cause death within 14 days in one half of the animals tested. A solid substance shall be tested if at least 10% (by mass) of its total mass is likely to be dust in a respirable range, e.g. the aerodynamic diameter of that particle-fraction is 10 µm or less. A liquid substance shall be tested if a mist is likely to be generated in a leakage of the transport containment. Both for solid and liquid substances more than 90% (by mass) of a specimen prepared for inhalation toxicity shall be in the respirable range as defined above. The result is expressed in milligrams per litre of air for dusts and mists or in millilitres per cubic metre of air (parts per million) for vapours.

Classification and assignment of packing groups

2.2.61.1.4 Substances of Class 6.1 shall be classified in three packing groups according to the degree of danger they present for carriage, as follows:

Packing group I: highly toxic substances
 Packing group II: toxic substances
 Packing group III: slightly toxic substances.

2.2.61.1.5 Substances, mixtures, solutions and articles classified in Class 6.1 are listed in Table A of Chapter 3.2. The assignment of substances, mixtures and solutions not mentioned by name in Table A of Chapter 3.2 to the relevant entry of sub-section 2.2.61.3 and to the relevant packing group in accordance with the provisions of Chapter 2.1, shall be made according to the following criteria in 2.2.61.1.6 to 2.2.61.1.11.

2.2.61.1.6 To assess the degree of toxicity, account shall be taken of human experience of instances of accidental poisoning, as well as special properties possessed by any individual substances: liquid state, high volatility, any special likelihood of cutaneous absorption, and special biological effects.

2.2.61.1.7 In the absence of observations on humans, the degree of toxicity shall be assessed using the available data from animal experiments in accordance with the table below:

	Packing group	Oral toxicity LD ₅₀ (mg/kg)	Dermal toxicity LD ₅₀ (mg/kg)	Inhalation toxicity by dusts and mists LC ₅₀ (mg/l)
Highly toxic	I	≤ 5.0	≤ 50	≤ 0.2
Toxic	II	> 5.0 and ≤ 50	> 50 and ≤ 200	> 0.2 and ≤ 2.0
Slightly toxic	III ^a	> 50 and ≤ 300	> 200 and ≤ 1 000	> 2.0 and ≤ 4.0

^a Tear gas substances shall be included in packing group II even if data concerning their toxicity correspond to packing group III criteria.

- 2.2.61.1.7.1 Where a substance exhibits different degrees of toxicity for two or more kinds of exposure, it shall be classified under the highest such degree of toxicity.
- 2.2.61.1.7.2 Substances meeting the criteria of Class 8 and with an inhalation toxicity of dusts and mists (LC_{50}) leading to packing group I shall only be accepted for an allocation to Class 6.1 if the toxicity through oral ingestion or dermal contact is at least in the range of packing groups I or II. Otherwise an assignment to Class 8 shall be made if appropriate (see footnote ⁶ in 2.2.8.1.4).
- 2.2.61.1.7.3 The criteria for inhalation toxicity of dusts and mists are based on LC_{50} data relating to 1-hour exposure, and where such information is available it shall be used. However, where only LC_{50} data relating to 4-hour exposure are available, such figures can be multiplied by four and the product substituted in the above criteria, i.e. LC_{50} value multiplied by four (4 hour) is considered the equivalent of LC_{50} (1 hour).

Inhalation toxicity of vapours

- 2.2.61.1.8 Liquids giving off toxic vapours shall be classified into the following groups where "V" is the saturated vapour concentration (in ml/m^3 of air) (volatility) at 20 °C and standard atmospheric pressure:

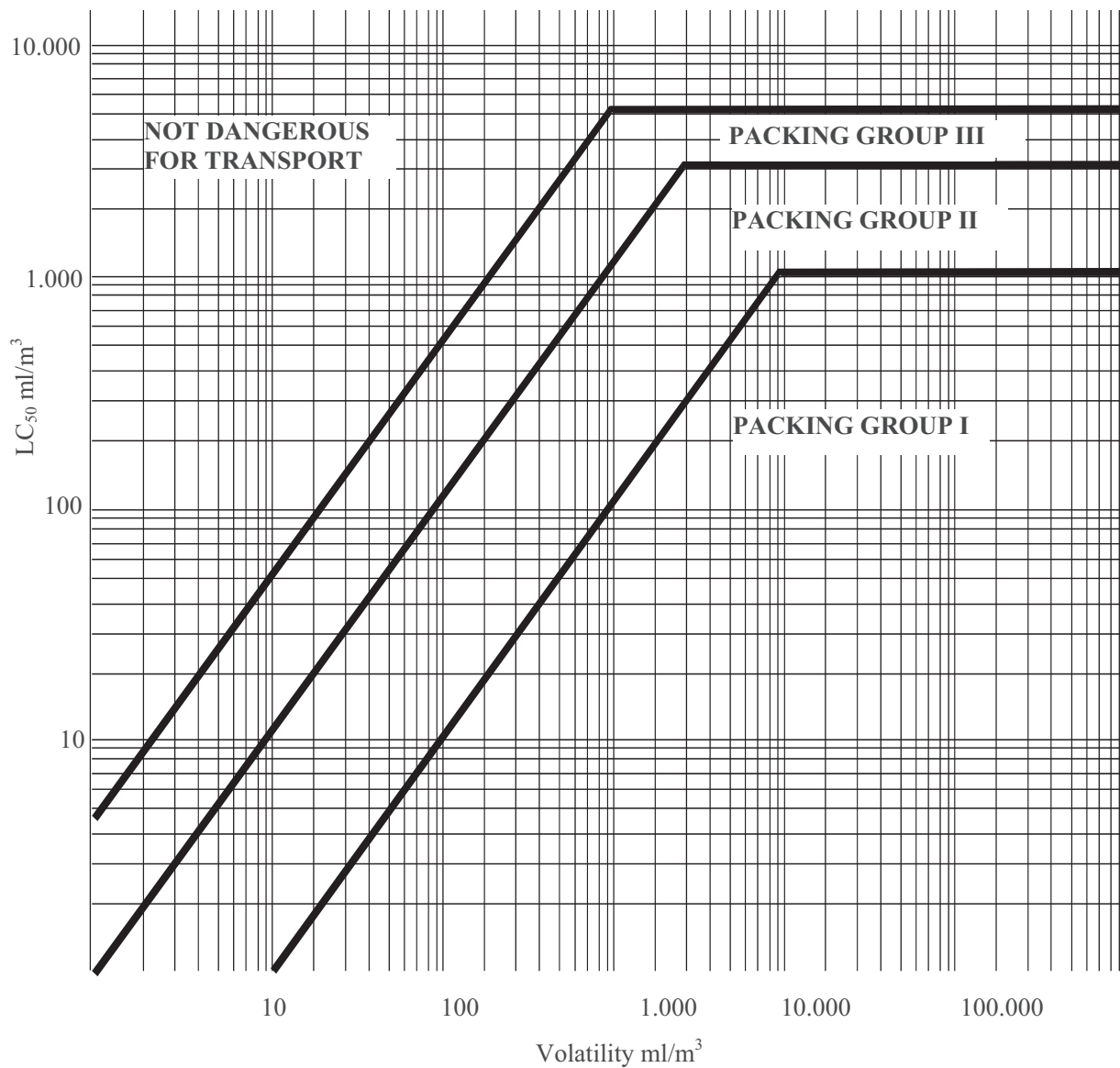
	Packing group	
Highly toxic	I	Where $V \geq 10 LC_{50}$ and $LC_{50} \leq 1\ 000\ ml/m^3$
Toxic	II	Where $V \geq LC_{50}$ and $LC_{50} \leq 3\ 000\ ml/m^3$ and the criteria for packing group I are not met
Slightly toxic	III ^a	Where $V \geq 1/5 LC_{50}$ and $LC_{50} \leq 5\ 000\ ml/m^3$ and the criteria for packing groups I and II are not met

^a *Tear gas substances shall be included in packing group II even if data concerning their toxicity correspond to packing group III criteria.*

These criteria for inhalation toxicity of vapours are based on LC_{50} data relating to 1-hour exposure, and where such information is available, it shall be used.

However, where only LC_{50} data relating to 4-hour exposure to the vapours are available, such figures can be multiplied by two and the product substituted in the above criteria, i.e. LC_{50} (4 hour) \times 2 is considered the equivalent of LC_{50} (1 hour).

Group borderlines inhalation toxicity of vapours



In this figure, the criteria are expressed in graphical form, as an aid to easy classification. However, due to approximations inherent in the use of graphs, substances falling on or near group borderlines shall be checked using numerical criteria.

Mixtures of liquids

2.2.61.1.9 Mixtures of liquids which are toxic on inhalation shall be assigned to packing groups according to the following criteria:

2.2.61.1.9.1 If LC_{50} is known for each of the toxic substances constituting the mixture, the packing group may be determined as follows:

(a) calculation of the LC_{50} of the mixture:

$$LC_{50}(\text{mixture}) = \frac{1}{\sum_{i=1}^n \frac{f_i}{LC_{50i}}}$$

where f_i = molar fraction of constituent i of the mixture;

LC_{50i} = average lethal concentration of constituent i in ml/m^3 .

(b) calculation of volatility of each mixture constituent:

$$V_i = P_i \times \frac{10^6}{101.3} (\text{ml/m}^3)$$

where P_i = partial pressure of constituent i in kPa at 20 °C and at standard atmospheric pressure.

(c) calculation of the ratio of volatility to LC_{50} :

$$R = \sum_{i=1}^n \frac{V_i}{LC_{50i}}$$

(d) the values calculated for $LC_{50}(\text{mixture})$ and R are then used to determine the packing group of the mixture:

Packing group I $R \geq 10$ and $LC_{50}(\text{mixture}) \leq 1\,000 \text{ ml/m}^3$;

Packing group II $R \geq 1$ and $LC_{50}(\text{mixture}) \leq 3\,000 \text{ ml/m}^3$, if the mixture does not meet the criteria for packing group I;

Packing group III $R \geq 1/5$ and $LC_{50}(\text{mixture}) \leq 5\,000 \text{ ml/m}^3$, if the mixture does not meet the criteria of packing groups I or II.

2.2.61.1.9.2 In the absence of LC_{50} data on the toxic constituent substances, the mixture may be assigned to a group based on the following simplified threshold toxicity tests. When these threshold tests are used, the most restrictive group shall be determined and used for carrying the mixture.

- 2.2.61.1.9.3 A mixture is assigned to packing group I only if it meets both of the following criteria:
- A sample of the liquid mixture is vaporized and diluted with air to create a test atmosphere of 1000 ml/m³ vaporized mixture in air. Ten albino rats (5 male and 5 female) are exposed to the test atmosphere for 1 hour and observed for 14 days. If five or more of the animals die within the 14-day observation period, the mixture is presumed to have an LC₅₀ equal to or less than 1000 ml/m³;
 - A sample of vapour in equilibrium with the liquid mixture is diluted with 9 equal volumes of air to form a test atmosphere. Ten albino rats (5 male and 5 female) are exposed to the test atmosphere for 1 hour and observed for 14 days. If five or more of the animals die within the 14-day observation period, the mixture is presumed to have a volatility equal to or greater than 10 times the mixture LC₅₀.
- 2.2.61.1.9.4 A mixture is assigned to packing group II only if it meets both of the following criteria, and does not meet the criteria for packing group I:
- A sample of the liquid mixture is vaporized and diluted with air to create a test atmosphere of 3000 ml/m³ vaporized mixture in air. Ten albino rats (5 male and 5 female) are exposed to the test atmosphere for 1 hour and observed for 14 days. If five or more of the animals die within the 14-day observation period, the mixture is presumed to have an LC₅₀ equal to or less than 3000 ml/m³;
 - A sample of the vapour in equilibrium with the liquid mixture is used to form a test atmosphere. Ten albino rats (5 male and 5 female) are exposed to the test atmosphere for 1 hour and observed for 14 days. If five or more of the animals die within the 14-day observation period, the mixture is presumed to have a volatility equal to or greater than the mixture LC₅₀.
- 2.2.61.1.9.5 A mixture is assigned to packing group III only if it meets both of the following criteria, and does not meet the criteria for packing groups I or II:
- A sample of the liquid mixture is vaporized and diluted with air to create a test atmosphere of 5000 ml/m³ vaporized mixture in air. Ten albino rats (5 male and 5 female) are exposed to the test atmosphere for 1 hour and observed for 14 days. If five or more of the animals die within the 14-day observation period, the mixture is presumed to have an LC₅₀ equal to or less than 5000 ml/m³;
 - The vapour concentration (volatility) of the liquid mixture is measured and if the vapour concentration is equal to or greater than 1000 ml/m³, the mixture is presumed to have a volatility equal to or greater than 1/5 the mixture LC₅₀.

Methods for determining oral and dermal toxicity of mixtures

- 2.2.61.1.10 When classifying and assigning the appropriate packing group to mixtures in Class 6.1 in accordance with the oral and dermal toxicity criteria (see 2.2.61.1.3), it is necessary to determine the acute LD₅₀ of the mixture.
- 2.2.61.1.10.1 If a mixture contains only one active substance, and the LD₅₀ of that constituent is known, in the absence of reliable acute oral and dermal toxicity data on the actual mixture to be carried, the oral or dermal LD₅₀ may be obtained by the following method:

$$\text{LD}_{50} \text{ value of preparation} = \frac{\text{LD}_{50} \text{ value of active substance} \times 100}{\text{percentage of active substance by mass}}$$

2.2.61.1.10.2 If a mixture contains more than one active constituent, there are three possible approaches that may be used to determine the oral or dermal LD₅₀ of the mixture. The preferred method is to obtain reliable acute oral and dermal toxicity data on the actual mixture to be carried. If reliable, accurate data are not available, then either of the following methods may be performed:

(a) Classify the formulation according to the most hazardous constituent of the mixture as if that constituent were present in the same concentration as the total concentration of all active constituents; or

(b) Apply the formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \dots + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

where:

C = the percentage concentration of constituent A, B, ... Z in the mixture;

T = the oral LD₅₀ values of constituent A, B, ... Z;

T_M = the oral LD₅₀ value of the mixture.

NOTE: This formula can also be used for dermal toxicities provided that this information is available on the same species for all constituents. The use of this formula does not take into account any potentiation or protective phenomena.

Classification of pesticides

2.2.61.1.11 All active pesticide substances and their preparations for which the LC₅₀ and/or LD₅₀ values are known and which are classified in Class 6.1 shall be classified under appropriate packing groups in accordance with the criteria given in 2.2.61.1.6 to 2.2.61.1.9. Substances and preparations which are characterized by subsidiary risks shall be classified according to the precedence of hazard Table in 2.1.3.10 with the assignment of appropriate packing groups.

2.2.61.1.11.1 If the oral or dermal LD₅₀ value for a pesticide preparation is not known, but the LD₅₀ value of its active substance(s) is known, the LD₅₀ value for the preparation may be obtained by applying the procedures in 2.2.61.1.10.

NOTE: LD₅₀ toxicity data for a number of common pesticides may be obtained from the most current edition of the document "The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification" available from the International Programme on Chemical Safety, World Health Organisation (WHO), 1211 Geneva 27, Switzerland. While that document may be used as a source of LD₅₀ data for pesticides, its classification system shall not be used for purposes of transport classification of, or assignment of packing groups to, pesticides, which shall be in accordance with the requirements of ADN.

2.2.61.1.11.2 The proper shipping name used in the carriage of the pesticide shall be selected on the basis of the active ingredient, of the physical state of the pesticide and any subsidiary risks it may exhibit (see 3.1.2).

- 2.2.61.1.12 If substances of Class 6.1, as a result of admixtures, come into categories of risk different from those to which the substances mentioned by name in Table A of Chapter 3.2 belong, these mixtures or solutions shall be assigned to the entries to which they belong on the basis of their actual degree of danger.

NOTE: For the classification of solutions and mixtures (such as preparations and wastes), see also 2.1.3.

- 2.2.61.1.13 On the basis of the criteria of 2.2.61.1.6 to 2.2.61.1.11, it may also be determined whether the nature of a solution or mixture mentioned by name or containing a substance mentioned by name is such that the solution or mixture is not subject to the requirements for this Class.

- 2.2.61.1.14 Substances, solutions and mixtures, with the exception of substances and preparations used as pesticides, which do not meet the criteria of Directives 67/548/EEC³ or 1999/45/EC⁴ as amended and which are not therefore classified as highly toxic, toxic or harmful according to these directives, as amended, may be considered as substances not belonging to Class 6.1.

2.2.61.2 Substances not accepted for carriage

- 2.2.61.2.1 Chemically unstable substances of Class 6.1 shall not be accepted for carriage unless the necessary steps have been taken to prevent their dangerous decomposition or polymerization during carriage. To this end, it shall in particular be ensured that receptacles and tanks do not contain any substance(s) likely to cause such a reaction.

- 2.2.61.2.2 The following substances and mixtures shall not be accepted for carriage:

- Hydrogen cyanide, anhydrous or in solution, which do not meet the descriptions of UN Nos. 1051, 1613, 1614 and 3294;
- Metal carbonyls, having a flash-point below 23 °C, other than UN Nos. 1259 NICKEL CARBONYL and 1994 IRON PENTACARBONYL;
- 2,3,7,8-TETRACHLORODIBENZO-p-DIOXINE (TCDD) in concentrations considered highly toxic in accordance with the criteria in 2.2.61.1.7;
- UN No. 2249 DICHLORODIMETHYL ETHER, SYMMETRICAL;
- Preparations of phosphides without additives inhibiting the emission of toxic flammable gases.

³ Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances (Official Journal of the European Communities No. L 196 of 16.08.1967, page 1).

⁴ Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 on the approximation of laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations (Official Journal of the European Communities No. L 200 of 30 July 1999, pages 1 to 68).

2.2.61.3 *List of collective entries***Toxic substances without subsidiary risk(s)**

Organic	liquid ^a	T1	1583 CHLOROPICRIN MIXTURE, N.O.S. 1602 DYE, LIQUID, TOXIC, N.O.S., or 1602 DYE INTERMEDIATE, LIQUID, TOXIC, N.O.S. 1693 TEAR GAS SUBSTANCE, LIQUID, N.O.S. 1851 MEDICINE, LIQUID, TOXIC, N.O.S. 2206 ISOCYANATES, TOXIC, N.O.S. or 2206 ISOCYANATE SOLUTION, TOXIC, N.O.S. 3140 ALKALOIDS, LIQUID, N.O.S. or 3140 ALKALOID SALTS, LIQUID, N.O.S. 3142 DISINFECTANT, LIQUID, TOXIC, N.O.S. 3144 NICOTINE COMPOUND, LIQUID, N.O.S. or 3144 NICOTINE PREPARATION, LIQUID, N.O.S. 3172 TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S. 3276 NITRILES, TOXIC, LIQUID, N.O.S. 3278 ORGANOPHOSPHORUS COMPOUND, TOXIC, LIQUID, N.O.S. 3381 TOXIC BY INHALATION LIQUID, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀ 3382 TOXIC BY INHALATION LIQUID, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀ 2810 TOXIC LIQUID, ORGANIC, N.O.S.
	solid ^{a, b}	T2	1544 ALKALOIDS, SOLID, N.O.S. or 1544 ALKALOID SALTS, SOLID, N.O.S. 1601 DISINFECTANT, SOLID, TOXIC, N.O.S. 1655 NICOTINE COMPOUND, SOLID, N.O.S., or 1655 NICOTINE PREPARATION, SOLID, N.O.S. 3448 TEAR GAS SUBSTANCE, SOLID, N.O.S. 3143 DYE, SOLID, TOXIC, N.O.S. or 3143 DYE INTERMEDIATE, SOLID, TOXIC, N.O.S. 3462 TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S. 3249 MEDICINE, SOLID, TOXIC, N.O.S. 3464 ORGANOPHOSPHORUS COMPOUND, TOXIC, SOLID, N.O.S. 3439 NITRILES, TOXIC, SOLID, N.O.S. 2811 TOXIC SOLID, ORGANIC, N.O.S.
Organometallic ^{c, d}		T3	2026 PHENYLMERCURIC COMPOUND, N.O.S. 2788 ORGANOTIN COMPOUND, LIQUID, N.O.S. 3146 ORGANOTIN COMPOUND, SOLID, N.O.S. 3280 ORGANOARSENIC COMPOUND, LIQUID, N.O.S. 3465 ORGANOARSENIC COMPOUND, SOLID, N.O.S. 3281 METAL CARBONYLS, LIQUID, N.O.S. 3466 METAL CARBONYLS, SOLID, N.O.S. 3282 ORGANOMETALLIC COMPOUND, TOXIC, LIQUID, N.O.S. 3467 ORGANOMETALLIC COMPOUND, TOXIC, SOLID, N.O.S.

(cont'd on next page)

^a Substances and preparations containing alkaloids or nicotine used as pesticides shall be classified under UN No. 2588 PESTICIDES, SOLID, TOXIC, N.O.S., UN No. 2902 PESTICIDES, LIQUID, TOXIC, N.O.S. or UN No. 2903 PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S.

^b Active substances and triturations or mixtures of substances intended for laboratories and experiments and for the manufacture of pharmaceutical products with other substances shall be classified according to their toxicity (see 2.2.61.1.7 to 2.2.61.1.11).

^c Self-heating substances, slightly toxic and spontaneously combustible organometallic compounds, are substances of Class 4.2.

^d Water-reactive substances, slightly toxic, and water-reactive organometallic compounds, are substances of Class 4.3.

2.2.61.3 *List of collective entries (cont'd)***Toxic substances without subsidiary risk(s) (cont'd)**

Inorganic	liquid^e T4	1556 ARSENIC COMPOUND, LIQUID, N.O.S., inorganic including: Arsenates, n.o.s., Arsenites, n.o.s.; and Arsenic sulphides, n.o.s. 1935 CYANIDE SOLUTION, N.O.S. 2024 MERCURY COMPOUND, LIQUID, N.O.S. 3141 ANTIMONY COMPOUND, INORGANIC, LIQUID, N.O.S. 3440 SELENIUM COMPOUND, LIQUID, N.O.S. 3381 TOXIC BY INHALATION LIQUID, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀ 3382 TOXIC BY INHALATION LIQUID, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀ 3287 TOXIC LIQUID, INORGANIC, N.O.S.
	solids^{f,g} T5	1549 ANTIMONY COMPOUND, INORGANIC, SOLID, N.O.S. 1557 ARSENIC COMPOUND, SOLID, N.O.S., including: Arsenates, n.o.s.; Arsenites, n.o.s.; and Arsenic sulphides, n.o.s. 1564 BARIUM COMPOUND, N.O.S. 1566 BERYLLIUM COMPOUND, N.O.S. 1588 CYANIDES, INORGANIC, SOLID, N.O.S. 1707 THALLIUM COMPOUND, N.O.S. 2025 MERCURY COMPOUND, SOLID, N.O.S. 2291 LEAD COMPOUND, SOLUBLE, N.O.S. 2570 CADMIUM COMPOUND 2630 SELENATES or 2630 SELENITES 2856 FLUOROSILICATES, N.O.S. 3283 SELENIUM COMPOUND, SOLID, N.O.S. 3284 TELLURIUM COMPOUND, N.O.S. 3285 VANADIUM COMPOUND, N.O.S. 3288 TOXIC SOLID, INORGANIC, N.O.S.
Pesticides	liquid^h T6	2992 CARBAMATE PESTICIDE, LIQUID, TOXIC 2994 ARSENICAL PESTICIDE, LIQUID, TOXIC 2996 ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC 2998 TRIAZINE PESTICIDE, LIQUID, TOXIC 3006 THIOCARBAMATE PESTICIDE, LIQUID, TOXIC 3010 COPPER BASED PESTICIDE, LIQUID, TOXIC 3012 MERCURY BASED PESTICIDE, LIQUID, TOXIC 3014 SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC 3016 BIPYRIDILUM PESTICIDE, LIQUID, TOXIC 3018 ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC 3020 ORGANOTIN PESTICIDE, LIQUID, TOXIC 3026 COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC 3348 PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC 3352 PYRETHROID PESTICIDE, LIQUID, TOXIC
<i>(cont'd on next page)</i>		

^e Mercury fulminate, wetted with not less than 20% water, or mixture of alcohol and water by mass is a substance of Class 1, UN No. 0135.

^f Ferricyanides, ferrocyanides, alkaline thiocyanates and ammonium thiocyanates are not subject to the provisions of ADN.

^g Lead salts and lead pigments which, when mixed in a ratio of 1:1,000 with 0.07M hydrochloric acid and stirred for one hour at a temperature of 23 °C ± 2 °C, exhibit a solubility of 5% or less, are not subject to the provisions of ADN.

^h Articles impregnated with this pesticide, such as fibreboard plates, paper strips, cotton-wool balls, sheets of plastics material, in hermetically closed wrappings, are not subject to the provisions of ADN.

2.2.61.3 *List of collective entries (cont'd)*Toxic substances without subsidiary risk(s) (cont'd)

Pesticides (cont'd)		
Solid ^h	T7	2902 PESTICIDE, LIQUID, TOXIC, N.O.S. 2757 CARBAMATE PESTICIDE, SOLID, TOXIC 2759 ARSENICAL PESTICIDE, SOLID, TOXIC 2761 ORGANOCHLORINE PESTICIDE, SOLID, TOXIC 2763 TRIAZINE PESTICIDE, SOLID, TOXIC 2771 THIOCARBAMATE PESTICIDE, SOLID, TOXIC 2775 COPPER BASED PESTICIDE, SOLID, TOXIC 2777 MERCURY BASED PESTICIDE, SOLID, TOXIC 2779 SUBSTITUTED NITROPHENOL PESTICIDE, SOLID, TOXIC 2781 BIPYRIDILUM PESTICIDE, SOLID, TOXIC 2783 ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC 2786 ORGANOTIN PESTICIDE, SOLID, TOXIC 3027 COUMARIN DERIVATIVE PESTICIDE, SOLID, TOXIC 3048 ALUMINIUM PHOSPHIDE PESTICIDE 3345 PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC 3349 PYRETHROID PESTICIDE, SOLID, TOXIC 2588 PESTICIDE, SOLID, TOXIC, N.O.S.
	T8	3315 CHEMICAL SAMPLE, TOXIC
	T9	3243 SOLIDS CONTAINING TOXIC LIQUID, N.O.S.

Toxic substances with subsidiary risk(s)

Flammable	Liquid ^{j, k}	TF1	3071 MERCAPTANS, LIQUID, TOXIC, FLAMMABLE, N.O.S. or 3071 MERCAPTAN MIXTURE, LIQUID, TOXIC, FLAMMABLE, N.O.S. 3080 ISOCYANATES, TOXIC, FLAMMABLE, N.O.S. or 3080 ISOCYANATE SOLUTION, TOXIC, FLAMMABLE, N.O.S. 3275 NITRILES, TOXIC, FLAMMABLE, N.O.S. 3279 ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE, N.O.S. 3383 TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀ 3384 TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀ 2929 TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.
			TF

(cont'd on next page)

^h Articles impregnated with this pesticide, such as fibreboard plates, paper strips, cotton-wool balls, sheets of plastics material, in hermetically closed wrappings, are not subject to the provisions of ADN.

ⁱ Mixtures of solids which are not subject to the provisions of ADN and of toxic liquids may be carried under UN No. 3243 without first applying the classification criteria of Class 6.1, provided there is no free liquid visible at the time the substance is loaded or at the time the packaging, container or cargo transport unit is closed. Each packaging shall correspond to a design type that has passed a leakproofness test at the packing group II level. This entry shall not be used for solids containing a packing group I liquid.

^j Highly toxic or toxic, flammable liquids having a flash-point below 23 °C excluding substances which are highly toxic on inhalation, i.e. UN Nos. 1051, 1092, 1098, 1143, 1163, 1182, 1185, 1238, 1239, 1244, 1251, 1259, 1613, 1614, 1695, 1994, 2334, 2382, 2407, 2438, 2480, 2482, 2484, 2485, 2606, 2929, 3279 and 3294 are substances of Class 3.

^k Flammable liquids, slightly toxic, with the exception of substances and preparations used as pesticides, having a flash-point between 23 °C and 60 °C inclusive, are substances of Class 3.

2.2.61.3 List of collective entries (cont'd)

Toxic substances with subsidiary risk(s) (cont'd)

Flammable TF (cont'd)	pesticides, liquid (flash- point not less than 23 °C)	TF2	2991 CARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			2993 ARSENICAL PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			2995 ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			2997 TRIAZINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			3005 THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			3009 COPPER BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			3011 MERCURY BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			3013 SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			3015 BIPYRIDILUM PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			3017 ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			3019 ORGANOTIN PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			3025 COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			3347 PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			3351 PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE
			2903 PESTICIDE, LIQUID, TOXIC, FLAMMABLE, N.O.S.
	solid	TF3	1700 TEAR GAS CANDLES
			2930 TOXIC SOLID, FLAMMABLE, ORGANIC, N.O.S.
Solid, self-heating ^c			3124 TOXIC SOLID, SELF-HEATING, N.O.S.
TS			
	liquid	TW1	3385 TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀
			3386 TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀
			3123 TOXIC LIQUID, WATER-REACTIVE, N.O.S.
Water-reactive ^d			
TW	solid ⁿ	TW2	3125 TOXIC SOLID, WATER-REACTIVE, N.O.S.
	liquid	TO1	3387 TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀
			3388 TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀
			3122 TOXIC LIQUID, OXIDIZING, N.O.S.
Oxidizing ¹			
TO	solid	TO2	3086 TOXIC SOLID, OXIDIZING, N.O.S.
	liquid	TC1	3277 CHLOROFORMATES, TOXIC, CORROSIVE, N.O.S.
			3361 CHLOROSILANES, TOXIC, CORROSIVE, N.O.S.
			3389 TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀
			3390 TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀
			2927 TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S.
Corro- sive ^m	organic		
TC	solid	TC2	2928 TOXIC SOLID, CORROSIVE, ORGANIC, N.O.S.

(cont'd on next page)

^c Self-heating substances, slightly toxic and spontaneously combustible organometallic compounds, are substances of Class 4.2.

^d Water-reactive substances, slightly toxic, and water-reactive organometallic compounds, are substances of Class 4.3.

¹ Oxidizing substances, slightly toxic, are substances of Class 5.1.

^m Substances slightly toxic and slightly corrosive, are substances of Class 8.

ⁿ Metal phosphides assigned to UN Nos. 1360, 1397, 1432, 1714, 2011 and 2013 are substances of Class 4.3.

2.2.61.3 List of collective entries (cont'd)

Toxic substances with subsidiary risk(s) (cont'd)

Corrosive ^m TC (cont'd)	organic (cont'd)	solid	TC2	2928 TOXIC SOLID, CORROSIVE, ORGANIC, N.O.S.
		liquid	TC3	3389 TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀ 3390 TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀ 3289 TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.
	inorga- nic			
		solid	TC4	3290 TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.
Flammable, corrosive TFC				2742 CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S. 3362 CHLOROSILANES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S. (No other collective entry available; if need be, classification under a collective entry with a classification code to be determined according to the table of precedence of hazards in 2.1.3.10)

^m Substances slightly toxic and slightly corrosive, are substances of Class 8.

2.2.62 Class 6.2 Infectious substances**2.2.62.1 Criteria**

2.2.62.1.1 The heading of Class 6.2 covers infectious substances. For the purposes of ADN, infectious substances are substances which are known or are reasonably expected to contain pathogens. Pathogens are defined as micro-organisms (including bacteria, viruses, rickettsiae, parasites, fungi) and other agents such as prions, which can cause disease in humans or animals.

NOTE 1: Genetically modified micro-organisms and organisms, biological products, diagnostic specimens and infected live animals shall be assigned to this Class if they meet the conditions for this Class.

NOTE 2: Toxins from plant, animal or bacterial sources which do not contain any infectious substances or organisms or which are not contained in them are substances of Class 6.1, UN No. 3172 or 3462.

2.2.62.1.2 Substances of Class 6.2 are subdivided as follows:

- I1 Infectious substances affecting humans;
- I2 Infectious substances affecting animals only;
- I3 Clinical waste;
- I4 Biological substances, category B.

Definitions

2.2.62.1.3 For the purposes of ADN,

"Biological products" are those products derived from living organisms which are manufactured and distributed in accordance with the requirements of appropriate national authorities, which may have special licensing requirements, and are used either for prevention, treatment, or diagnosis of disease in humans or animals, or for development, experimental or investigational purposes related thereto. They include, but are not limited to, finished or unfinished products such as vaccines;

"Cultures" are the result of a process by which pathogens are intentionally propagated. This definition does not include human or animal patient specimens as defined in this paragraph;

"Genetically modified micro-organisms and organisms" are micro-organisms and organisms in which genetic material has been purposely altered through genetic engineering in a way that does not occur naturally;

"Medical or clinical wastes" are wastes derived from the medical treatment of animals or humans or from bio-research;

"Patient specimens" are human or animal materials, collected directly from humans or animals, including, but not limited to, excreta, secretions, blood and its components, tissue and tissue fluid swabs, and body parts being carried for purposes such as research, diagnosis, investigational activities, disease treatment and prevention.

Classification

2.2.62.1.4 Infectious substances shall be classified in Class 6.2 and assigned to UN Nos 2814, 2900, 3291 or 3373, as appropriate.

Infectious substances are divided into the following categories:

2.2.62.1.4.1 Category A: An infectious substance which is carried in a form that, when exposure to it occurs, is capable of causing permanent disability, life-threatening or fatal disease in otherwise healthy humans or animals. Indicative examples of substances that meet these criteria are given in the table in this paragraph.

NOTE : *An exposure occurs when an infectious substance is released outside of the protective packaging, resulting in physical contact with humans or animals.*

- (a) Infectious substances meeting these criteria which cause disease in humans or both in humans and animals shall be assigned to UN No. 2814. Infectious substances which cause disease only in animals shall be assigned to UN No. 2900;
- (b) Assignment to UN No. 2814 or UN No. 2900 shall be based on the known medical history and symptoms of the source human or animal, endemic local conditions, or professional judgement concerning individual circumstances of the source human or animal.

NOTE 1: *The proper shipping name for UN No. 2814 is “INFECTIOUS SUBSTANCE, AFFECTING HUMANS”. The proper shipping name for UN No. 2900 is “INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only”.*

NOTE 2: *The following table is not exhaustive. Infectious substances, including new or emerging pathogens, which do not appear in the table but which meet the same criteria shall be assigned to Category A. In addition, if there is doubt as to whether or not a substance meets the criteria it shall be included in Category A.*

NOTE 3: *In the following table, the micro-organisms written in italics are bacteria, mycoplasmas, rickettsia or fungi.*

INDICATIVE EXAMPLES OF INFECTIOUS SUBSTANCES INCLUDED IN CATEGORY A IN ANY FORM UNLESS OTHERWISE INDICATED (2.2.62.1.4.1)	
UN Number and name	Microorganism
UN No. 2814 Infectious substances affecting humans	<i>Bacillus anthracis (cultures only)</i> <i>Brucella abortus (cultures only)</i> <i>Brucella melitensis (cultures only)</i> <i>Brucella suis (cultures only)</i> <i>Burkholderia mallei - Pseudomonas mallei – Glanders (cultures only)</i> <i>Burkholderia pseudomallei – Pseudomonas pseudomallei (cultures only)</i> <i>Chlamydia psittaci - avian strains (cultures only)</i> <i>Clostridium botulinum (cultures only)</i> <i>Coccidioides immitis (cultures only)</i> <i>Coxiella burnetii (cultures only)</i> Crimean-Congo haemorrhagic fever virus Dengue virus (cultures only) Eastern equine encephalitis virus (cultures only) <i>Escherichia coli, verotoxigenic (cultures only)</i> ^a Ebola virus Flexal virus <i>Francisella tularensis (cultures only)</i> Guanarito virus Hantaan virus Hantavirus causing haemorrhagic fever with renal syndrome Hendra virus Hepatitis B virus (cultures only) Herpes B virus (cultures only) Human immunodeficiency virus (cultures only) Highly pathogenic avian influenza virus (cultures only) Japanese Encephalitis virus (cultures only) Junin virus Kyasanur Forest disease virus Lassa virus Machupo virus Marburg virus Monkeypox virus <i>Mycobacterium tuberculosis (cultures only)</i> ^a Nipah virus Omsk haemorrhagic fever virus Poliovirus (cultures only) Rabies virus (cultures only) <i>Rickettsia prowazekii (cultures only)</i> <i>Rickettsia rickettsii (cultures only)</i> Rift Valley fever virus (cultures only) Russian spring-summer encephalitis virus (cultures only) Sabia virus <i>Shigella dysenteriae type 1 (cultures only)</i> ^a Tick-borne encephalitis virus (cultures only) Variola virus Venezuelan equine encephalitis virus (cultures only) West Nile virus (cultures only) Yellow fever virus (cultures only) <i>Yersinia pestis (cultures only)</i>

^a Nevertheless, when the cultures are intended for diagnostic or clinical purposes, they may be classified as infectious substances of Category B.

INDICATIVE EXAMPLES OF INFECTIOUS SUBSTANCES INCLUDED IN CATEGORY A IN ANY FORM UNLESS OTHERWISE INDICATED (2.2.62.1.4.1)	
UN Number and name	Microorganism
UN No. 2900 Infectious substances affecting animals only	African swine fever virus (cultures only) Avian paramyxovirus Type 1 - Velogenic Newcastle disease virus (cultures only) Classical swine fever virus (cultures only) Foot and mouth disease virus (cultures only) Lumpy skin disease virus (cultures only) <i>Mycoplasma mycoides</i> - Contagious bovine pleuropneumonia (cultures only) Peste des petits ruminants virus (cultures only) Rinderpest virus (cultures only) Sheep-pox virus (cultures only) Goatpox virus (cultures only) Swine vesicular disease virus (cultures only) Vesicular stomatitis virus (cultures only)

2.2.62.1.4.2 Category B: An infectious substance which does not meet the criteria for inclusion in Category A. Infectious substances in Category B shall be assigned to UN No. 3373.

NOTE: *The proper shipping name of UN No. 3373 is "BIOLOGICAL SUBSTANCE, CATEGORY B".*

2.2.62.1.5 *Exemptions*

2.2.62.1.5.1 Substances which do not contain infectious substances or substances which are unlikely to cause disease in humans or animals are not subject to the provisions of ADN unless they meet the criteria for inclusion in another class.

2.2.62.1.5.2 Substances containing microorganisms which are non-pathogenic to humans or animals are not subject to ADN unless they meet the criteria for inclusion in another class.

2.2.62.1.5.3 Substances in a form that any present pathogens have been neutralized or inactivated such that they no longer pose a health risk are not subject to ADN unless they meet the criteria for inclusion in another class.

2.2.62.1.5.4 Substances where the concentration of pathogens is at a level naturally encountered (including foodstuff and water samples) and which are not considered to pose a significant risk of infection are not subject to ADN unless they meet the criteria for inclusion in another class.

2.2.62.1.5.5 Dried blood spots, collected by applying a drop of blood onto absorbent material, or faecal occult blood screening tests and blood or blood components which have been collected for the purposes of transfusion or for the preparation of blood products to be used for transfusion or transplantation and any tissues or organs intended for use in transplantation are not subject to the provisions of ADN.

2.2.62.1.5.6 Human or animal specimens for which there is minimal likelihood that pathogens are present are not subject to ADN if the specimen is carried in a packaging which will prevent any leakage and which is marked with the words "Exempt human specimen" or "Exempt animal specimen", as appropriate.

The packaging is deemed to comply with the above requirements if it meets the following conditions:

- (a) The packaging consists of three components:
 - (i) a leak-proof primary receptacle(s);
 - (ii) a leak-proof secondary packaging; and
 - (iii) an outer packaging of adequate strength for its capacity, mass and intended use, and with at least one surface having minimum dimensions of 100 mm × 100 mm;
- (b) For liquids, absorbent material in sufficient quantity to absorb the entire contents is placed between the primary receptacle(s) and the secondary packaging so that, during carriage, any release or leak of a liquid substance will not reach the outer packaging and will not compromise the integrity of the cushioning material;
- (c) When multiple fragile primary receptacles are placed in a single secondary packaging, they are either individually wrapped or separated to prevent contact between them.

NOTE 1: *An element of professional judgement is required to determine if a substance is exempt under this paragraph. That judgement should be based on the known medical history, symptoms and individual circumstances of the source, human or animal, and endemic local conditions. Examples of specimens which may be carried under this paragraph include blood or urine tests to monitor cholesterol levels, blood glucose levels, hormone levels, or prostate specific antibodies (PSA); those required to monitor organ function such as heart, liver or kidney function for humans or animals with non-infectious diseases, or for therapeutic drug monitoring; those conducted for insurance or employment purposes and intended to determine the presence of drugs or alcohol; pregnancy tests; biopsies to detect cancer; and antibody detection in humans or animals in the absence of any concern for infection (e.g. evaluation of vaccine induced immunity, diagnosis of autoimmune disease, etc.).*

NOTE 2: *For air transport, packagings for specimens exempted under this paragraph shall meet the conditions in (a) to (c).*

2.2.62.1.6-
2.2.62.1.8

(Reserved)

2.2.62.1.9

Biological products

For the purposes of ADN, biological products are divided into the following groups:

- (a) those which are manufactured and packaged in accordance with the requirements of appropriate national authorities and carried for the purposes of final packaging or distribution, and use for personal health care by medical professionals or individuals. Substances in this group are not subject to the provisions of ADN;
- (b) those which do not fall under paragraph (a) and are known or reasonably believed to contain infectious substances and which meet the criteria for inclusion in Category A or Category B. Substances in this group shall be assigned to UN No. 2814, UN No. 2900 or UN No. 3373, as appropriate.

NOTE: *Some licensed biological products may present a biohazard only in certain parts of the world. In that case, competent authorities may require these biological products to be in compliance with local requirements for infectious substances or may impose other restrictions.*

2.2.62.1.10 *Genetically modified micro-organisms and organisms*

Genetically modified micro-organisms not meeting the definition of infectious substance shall be classified according to section 2.2.9.

2.2.62.1.11 *Medical or clinical wastes*

- 2.2.62.1.11.1 Medical or clinical wastes containing Category A infectious substances shall be assigned to UN No. 2814 or UN No. 2900 as appropriate. Medical or clinical wastes containing infectious substances in Category B shall be assigned to UN No. 3291.

NOTE: Medical or clinical wastes assigned to number 18 01 03 (Wastes from human or animal health care and/or related research – wastes from natal care, diagnosis, treatment or prevention of disease in humans – wastes whose collection and disposal is subject to special requirement in order to prevent infection) or 18 02 02 (Wastes from human or animal health care and/or related research – wastes from research, diagnosis, treatment or prevention of disease involving animals – wastes whose collection and disposal is subject to special requirements in order to prevent infection) according to the list of wastes annexed to the Commission Decision 2000/532/EC⁵ as amended, shall be classified according to the provisions set out in this paragraph, based on the medical or veterinary diagnosis concerning the patient or the animal.

- 2.2.62.1.11.2 Medical or clinical wastes which are reasonably believed to have a low probability of containing infectious substances shall be assigned to UN No. 3291. For the assignment, international, regional or national waste catalogues may be taken into account.

NOTE 1: The proper shipping name for UN No. 3291 is "CLINICAL WASTE, UNSPECIFIED, N.O.S." or "(BIO) MEDICAL WASTE, N.O.S." or "REGULATED MEDICAL WASTE, N.O.S."

NOTE 2: Notwithstanding the classification criteria set out above, medical or clinical wastes assigned to number 18 01 04 (Wastes from human or animal health care and/or related research – wastes from natal care, diagnosis, treatment or prevention of disease in humans – wastes whose collection and disposal is not subject to special requirements in order to prevent infection) or 18 02 03 (Wastes from human or animal health care and/or related research – wastes from research, diagnosis, treatment or prevention of disease involving animals – wastes whose collection and disposal is not subject to special requirements in order to prevent infection) according to the list of wastes annexed to the Commission Decision 2000/532/EC⁵ as amended, are not subject to the provisions of ADN.

- 2.2.62.1.11.3 Decontaminated medical or clinical wastes which previously contained infectious substances are not subject to the provisions of ADN unless they meet the criteria for inclusion in another class.

- 2.2.62.1.11.4 Medical or clinical wastes assigned to UN No. 3291 are assigned to packing group II.

⁵ Commission Decision 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste (replaced by the Directive 2006/12/EC of the European Parliament and of the Council (Official Journal of the European Communities No. L 114 of 27 April 2006, page 9)) and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (Official Journal of the European Communities No. L 226 of 6 September 2000, page 3).

2.2.62.1.12 *Infected animals*

2.2.62.1.12.1 Unless an infectious substance cannot be consigned by any other means, live animals shall not be used to consign such a substance. A live animal which has been intentionally infected and is known or suspected to contain an infectious substance shall only be carried under terms and conditions approved by the competent authority⁶.

2.2.62.1.12.2 Animal material affected by pathogens of Category A or by pathogens which would be assigned to Category A in cultures only, shall be assigned to UN 2814 or UN 2900 as appropriate. Animal material affected by pathogens of Category B, other than those which would be assigned to Category A if they were in cultures, shall be assigned to UN 3373.

2.2.62.2 *Substances not accepted for carriage*

Live vertebrate or invertebrate animals shall not be used to carry an infectious agent unless the agent cannot be carried by other means or unless this carriage has been approved by the competent authority (see 2.2.62.1.12.1).

2.2.62.3 *List of collective entries*

Effects on humans	I1	2814 INFECTIOUS SUBSTANCE, AFFECTING HUMANS
Effects on animals only	I2	2900 INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only
Clinical waste	I3	3291 CLINICAL WASTE, UNSPECIFIED, N.O.S. or 3291 (BIO)MEDICAL WASTE, N.O.S. or 3291 REGULATED MEDICAL WASTE, N.O.S.
Biological substances	I4	3373 BIOLOGICAL SUBSTANCE, CATEGORY B

⁶ Such regulations are contained in, e.g. Directive 91/628/EEC (Official Journal of the European Communities No. L 340 of 11 December 1991, p. 17) and in the Recommendations of the Council of Europe (Ministerial Committee) on the carriage of certain animal species.

2.2.7 Class 7 Radioactive material**2.2.7.1 Definitions**

2.2.7.1.1 *Radioactive material* means any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in 2.2.7.2.2.1 to 2.2.7.2.2.6.

2.2.7.1.2 *Contamination*

Contamination means the presence of a radioactive substance on a surface in quantities in excess of 0.4 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 0.04 Bq/cm² for all other alpha emitters.

Non-fixed contamination means contamination that can be removed from a surface during routine conditions of carriage.

Fixed contamination means contamination other than non-fixed contamination.

2.2.7.1.3 *Definitions of specific terms*

A₁ and A₂

A₁ means the activity value of special form radioactive material which is listed in the Table in 2.2.7.2.2.1 or derived in 2.2.7.2.2.2 and is used to determine the activity limits for the requirements of ADN.

A₂ means the activity value of radioactive material, other than special form radioactive material, which is listed in the Table in 2.2.7.2.2.1 or derived in 2.2.7.2.2.2 and is used to determine the activity limits for the requirements of ADN.

Fissile material means uranium-233, uranium-235, plutonium-239, plutonium-241, or any combination of these radionuclides. Excepted from this definition is:

- (a) Natural uranium or depleted uranium which is unirradiated; and
- (b) Natural uranium or depleted uranium which has been irradiated in thermal reactors only.

Low dispersible radioactive material means either a solid radioactive material or a solid radioactive material in a sealed capsule, that has limited dispersibility and is not in powder form.

Low specific activity (LSA) material means radioactive material which by its nature has a limited specific activity, or radioactive material for which limits of estimated average specific activity apply. External shielding materials surrounding the LSA material shall not be considered in determining the estimated average specific activity.

Low toxicity alpha emitters are: natural uranium; depleted uranium; natural thorium; uranium-235 or uranium-238; thorium-232; thorium-228 and thorium-230 when contained in ores or physical and chemical concentrates; or alpha emitters with a half-life of less than 10 days.

Specific activity of a radionuclide means the activity per unit mass of that nuclide. The specific activity of a material shall mean the activity per unit mass of the material in which the radionuclides are essentially uniformly distributed.

Special form radioactive material means either:

- (a) An indispersible solid radioactive material; or
- (b) A sealed capsule containing radioactive material.

Surface contaminated object (SCO) means a solid object which is not itself radioactive but which has radioactive material distributed on its surfaces.

Unirradiated thorium means thorium containing not more than 10^{-7} g of uranium-233 per gram of thorium-232.

Unirradiated uranium means uranium containing not more than 2×10^3 Bq of plutonium per gram of uranium-235, not more than 9×10^6 Bq of fission products per gram of uranium-235 and not more than 5×10^{-3} g of uranium-236 per gram of uranium-235.

Uranium - natural, depleted, enriched means the following:

Natural uranium means uranium (which may be chemically separated) containing the naturally occurring distribution of uranium isotopes (approximately 99.28% uranium-238, and 0.72% uranium-235 by mass).

Depleted uranium means uranium containing a lesser mass percentage of uranium-235 than in natural uranium.

Enriched uranium means uranium containing a greater mass percentage of uranium-235 than 0.72%.

In all cases, a very small mass percentage of uranium-234 is present.

2.2.7.2 **Classification**

2.2.7.2.1 *General provisions*

- 2.2.7.2.1.1 Radioactive material shall be assigned to one of the UN number specified in Table 2.2.7.2.1.1 depending on the activity level of the radionuclides contained in a package, the fissile or non-fissile properties of these radionuclides, the type of package to be presented for carriage, and the nature or form of the contents of the package, or special arrangements governing the carriage operation, in accordance with the provisions laid down in 2.2.7.2.2 to 2.2.7.2.5.

Table 2.2.7.2.1.1 Assignment of UN numbers

Excepted packages (1.7.1.5)	
UN 2908	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - EMPTY PACKAGING
UN 2909	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – ARTICLES MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or NATURAL THORIUM
UN 2910	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY OF MATERIAL
UN 2911	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - INSTRUMENTS or ARTICLES

Low specific activity radioactive material	
(2.2.7.2.3.1)	
UN 2912	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), non-fissile or fissile-excepted
UN 3321	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), non fissile or fissile-excepted
UN 3322	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III), non fissile or fissile-excepted
UN 3324	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), FISSILE
UN 3325	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III), FISSILE
Surface contaminated objects	
(2.2.7.2.3.2)	
UN 2913	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), non-fissile or fissile-excepted
UN 3326	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), FISSILE
Type A packages	
(2.2.7.2.4.4)	
UN 2915	RADIOACTIVE MATERIAL, TYPE A PACKAGE, non-special form, non-fissile or fissile-excepted
UN 3327	RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE, non-special form
UN 3332	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, non fissile or fissile-excepted
UN 3333	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE
Type B(U) packages	
(2.2.7.2.4.6)	
UN 2916	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, non-fissile or fissile-excepted
UN 3328	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE
Type B(M) packages	
(2.2.7.2.4.6)	
UN 2917	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, non-fissile or fissile-excepted
UN 3329	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE
Type C packages	
(2.2.7.2.4.6)	
UN 3323	RADIOACTIVE MATERIAL, TYPE C PACKAGE, non fissile or fissile-excepted
UN 3330	RADIOACTIVE MATERIAL, TYPE C PACKAGE, FISSILE
Special arrangement	
(2.2.7.2.5)	
UN 2919	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, non-fissile or fissile-excepted
UN 3331	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, FISSILE
Uranium hexafluoride	
(2.2.7.2.4.5)	
UN 2977	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE
UN 2978	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, non-fissile or fissile-excepted

2.2.7.2.2 *Determination of activity level*

2.2.7.2.2.1 The following basic values for individual radionuclides are given in Table 2.2.7.2.2.1:

- (a) A_1 and A_2 in TBq;
- (b) Activity concentration for exempt material in Bq/g; and
- (c) Activity limits for exempt consignments in Bq.

Table 2.2.7.2.2.1: Basic radionuclides values for individual radionuclides

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Actinium (89)				
Ac-225 (a)	8×10^{-1}	6×10^{-3}	1×10^1	1×10^4
Ac-227 (a)	9×10^{-1}	9×10^{-5}	1×10^{-1}	1×10^3
Ac-228	6×10^{-1}	5×10^{-1}	1×10^1	1×10^6
Silver (47)				
Ag-105	2×10^0	2×10^0	1×10^2	1×10^6
Ag-108m (a)	7×10^{-1}	7×10^{-1}	1×10^1 (b)	1×10^6 (b)
Ag-110m (a)	4×10^{-1}	4×10^{-1}	1×10^1	1×10^6
Ag-111	2×10^0	6×10^{-1}	1×10^3	1×10^6
Aluminium (13)				
Al-26	1×10^{-1}	1×10^{-1}	1×10^1	1×10^5
Americium (95)				
Am-241	1×10^1	1×10^{-3}	1×10^0	1×10^4
Am-242m (a)	1×10^1	1×10^{-3}	1×10^0 (b)	1×10^4 (b)
Am-243 (a)	5×10^0	1×10^{-3}	1×10^0 (b)	1×10^3 (b)
Argon (18)				
Ar-37	4×10^1	4×10^1	1×10^6	1×10^8
Ar-39	4×10^1	2×10^1	1×10^7	1×10^4
Ar-41	3×10^{-1}	3×10^{-1}	1×10^2	1×10^9
Arsenic (33)				
As-72	3×10^{-1}	3×10^{-1}	1×10^1	1×10^5
As-73	4×10^1	4×10^1	1×10^3	1×10^7
As-74	1×10^0	9×10^{-1}	1×10^1	1×10^6
As-76	3×10^{-1}	3×10^{-1}	1×10^2	1×10^5
As-77	2×10^1	7×10^{-1}	1×10^3	1×10^6
Astatine (85)				
At-211 (a)	2×10^1	5×10^{-1}	1×10^3	1×10^7
Gold (79)				
Au-193	7×10^0	2×10^0	1×10^2	1×10^7

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Au-194	1×10^0	1×10^0	1×10^1	1×10^6
Au-195	1×10^1	6×10^0	1×10^2	1×10^7
Au-198	1×10^0	6×10^{-1}	1×10^2	1×10^6
Au-199	1×10^1	6×10^{-1}	1×10^2	1×10^6
Barium (56)				
Ba-131 (a)	2×10^0	2×10^0	1×10^2	1×10^6
Ba-133	3×10^0	3×10^0	1×10^2	1×10^6
Ba-133m	2×10^1	6×10^{-1}	1×10^2	1×10^6
Ba-140 (a)	5×10^{-1}	3×10^{-1}	1×10^1 (b)	1×10^5 (b)
Beryllium (4)				
Be-7	2×10^1	2×10^1	1×10^3	1×10^7
Be-10	4×10^1	6×10^{-1}	1×10^4	1×10^6
Bismuth (83)				
Bi-205	7×10^{-1}	7×10^{-1}	1×10^1	1×10^6
Bi-206	3×10^{-1}	3×10^{-1}	1×10^1	1×10^5
Bi-207	7×10^{-1}	7×10^{-1}	1×10^1	1×10^6
Bi-210	1×10^0	6×10^{-1}	1×10^3	1×10^6
Bi-210m (a)	6×10^{-1}	2×10^{-2}	1×10^1	1×10^5
Bi-212 (a)	7×10^{-1}	6×10^{-1}	1×10^1 (b)	1×10^5 (b)
Berkelium (97)				
Bk-247	8×10^0	8×10^{-4}	1×10^0	1×10^4
Bk-249 (a)	4×10^1	3×10^{-1}	1×10^3	1×10^6
Bromine (35)				
Br-76	4×10^{-1}	4×10^{-1}	1×10^1	1×10^5
Br-77	3×10^0	3×10^0	1×10^2	1×10^6
Br-82	4×10^{-1}	4×10^{-1}	1×10^1	1×10^6
Carbon (6)				
C-11	1×10^0	6×10^{-1}	1×10^1	1×10^6
C-14	4×10^1	3×10^0	1×10^4	1×10^7
Calcium (20)				
Ca-41	Unlimited	Unlimited	1×10^5	1×10^7

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Ca-45	4×10^1	1×10^0	1×10^4	1×10^7
Ca-47 (a)	3×10^0	3×10^{-1}	1×10^1	1×10^6
Cadmium (48)				
Cd-109	3×10^1	2×10^0	1×10^4	1×10^6
Cd-113m	4×10^1	5×10^{-1}	1×10^3	1×10^6
Cd-115 (a)	3×10^0	4×10^{-1}	1×10^2	1×10^6
Cd-115m	5×10^{-1}	5×10^{-1}	1×10^3	1×10^6
Cerium (58)				
Ce-139	7×10^0	2×10^0	1×10^2	1×10^6
Ce-141	2×10^1	6×10^{-1}	1×10^2	1×10^7
Ce-143	9×10^{-1}	6×10^{-1}	1×10^2	1×10^6
Ce-144 (a)	2×10^{-1}	2×10^{-1}	1×10^2 (b)	1×10^5 (b)
Californium (98)				
Cf-248	4×10^1	6×10^{-3}	1×10^1	1×10^4
Cf-249	3×10^0	8×10^{-4}	1×10^0	1×10^3
Cf-250	2×10^1	2×10^{-3}	1×10^1	1×10^4
Cf-251	7×10^0	7×10^{-4}	1×10^0	1×10^3
Cf-252	1×10^{-1}	3×10^{-3}	1×10^1	1×10^4
Cf-253 (a)	4×10^1	4×10^{-2}	1×10^2	1×10^5
Cf-254	1×10^{-3}	1×10^{-3}	1×10^0	1×10^3
Chlorine (17)				
Cl-36	1×10^1	6×10^{-1}	1×10^4	1×10^6
Cl-38	2×10^{-1}	2×10^{-1}	1×10^1	1×10^5
Curium (96)				
Cm-240	4×10^1	2×10^{-2}	1×10^2	1×10^5
Cm-241	2×10^0	1×10^0	1×10^2	1×10^6
Cm-242	4×10^1	1×10^{-2}	1×10^2	1×10^5
Cm-243	9×10^0	1×10^{-3}	1×10^0	1×10^4
Cm-244	2×10^1	2×10^{-3}	1×10^1	1×10^4
Cm-245	9×10^0	9×10^{-4}	1×10^0	1×10^3
Cm-246	9×10^0	9×10^{-4}	1×10^0	1×10^3

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Cm-247 (a)	3×10^0	1×10^{-3}	1×10^0	1×10^4
Cm-248	2×10^{-2}	3×10^{-4}	1×10^0	1×10^3
Cobalt (27)				
Co-55	5×10^{-1}	5×10^{-1}	1×10^1	1×10^6
Co-56	3×10^{-1}	3×10^{-1}	1×10^1	1×10^5
Co-57	1×10^1	1×10^1	1×10^2	1×10^6
Co-58	1×10^0	1×10^0	1×10^1	1×10^6
Co-58m	4×10^1	4×10^1	1×10^4	1×10^7
Co-60	4×10^{-1}	4×10^{-1}	1×10^1	1×10^5
Chromium (24)				
Cr-51	3×10^1	3×10^1	1×10^3	1×10^7
Caesium (55)				
Cs-129	4×10^0	4×10^0	1×10^2	1×10^5
Cs-131	3×10^1	3×10^1	1×10^3	1×10^6
Cs-132	1×10^0	1×10^0	1×10^1	1×10^5
Cs-134	7×10^{-1}	7×10^{-1}	1×10^1	1×10^4
Cs-134m	4×10^1	6×10^{-1}	1×10^3	1×10^5
Cs-135	4×10^1	1×10^0	1×10^4	1×10^7
Cs-136	5×10^{-1}	5×10^{-1}	1×10^1	1×10^5
Cs-137 (a)	2×10^0	6×10^{-1}	1×10^1 (b)	1×10^4 (b)
Copper (29)				
Cu-64	6×10^0	1×10^0	1×10^2	1×10^6
Cu-67	1×10^1	7×10^{-1}	1×10^2	1×10^6
Dysprosium (66)				
Dy-159	2×10^1	2×10^1	1×10^3	1×10^7
Dy-165	9×10^{-1}	6×10^{-1}	1×10^3	1×10^6
Dy-166 (a)	9×10^{-1}	3×10^{-1}	1×10^3	1×10^6
Erbium (68)				
Er-169	4×10^1	1×10^0	1×10^4	1×10^7
Er-171	8×10^{-1}	5×10^{-1}	1×10^2	1×10^6
Europium (63)				

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Eu-147	2×10^0	2×10^0	1×10^2	1×10^6
Eu-148	5×10^{-1}	5×10^{-1}	1×10^1	1×10^6
Eu-149	2×10^1	2×10^1	1×10^2	1×10^7
Eu-150(short lived)	2×10^0	7×10^{-1}	1×10^3	1×10^6
Eu-150(long lived)	7×10^{-1}	7×10^{-1}	1×10^1	1×10^6
Eu-152	1×10^0	1×10^0	1×10^1	1×10^6
Eu-152m	8×10^{-1}	8×10^{-1}	1×10^2	1×10^6
Eu-154	9×10^{-1}	6×10^{-1}	1×10^1	1×10^6
Eu-155	2×10^1	3×10^0	1×10^2	1×10^7
Eu-156	7×10^{-1}	7×10^{-1}	1×10^1	1×10^6
Fluorine (9)				
F-18	1×10^0	6×10^{-1}	1×10^1	1×10^6
Iron (26)				
Fe-52 (a)	3×10^{-1}	3×10^{-1}	1×10^1	1×10^6
Fe-55	4×10^1	4×10^1	1×10^4	1×10^6
Fe-59	9×10^{-1}	9×10^{-1}	1×10^1	1×10^6
Fe-60 (a)	4×10^1	2×10^{-1}	1×10^2	1×10^5
Gallium (31)				
Ga-67	7×10^0	3×10^0	1×10^2	1×10^6
Ga-68	5×10^{-1}	5×10^{-1}	1×10^1	1×10^5
Ga-72	4×10^{-1}	4×10^{-1}	1×10^1	1×10^5
Gadolinium (64)				
Gd-146 (a)	5×10^{-1}	5×10^{-1}	1×10^1	1×10^6
Gd-148	2×10^1	2×10^{-3}	1×10^1	1×10^4
Gd-153	1×10^1	9×10^0	1×10^2	1×10^7
Gd-159	3×10^0	6×10^{-1}	1×10^3	1×10^6
Germanium (32)				
Ge-68 (a)	5×10^{-1}	5×10^{-1}	1×10^1	1×10^5
Ge-71	4×10^1	4×10^1	1×10^4	1×10^8
Ge-77	3×10^{-1}	3×10^{-1}	1×10^1	1×10^5
Hafnium (72)				

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Hf-172 (a)	6×10^{-1}	6×10^{-1}	1×10^1	1×10^6
Hf-175	3×10^0	3×10^0	1×10^2	1×10^6
Hf-181	2×10^0	5×10^{-1}	1×10^1	1×10^6
Hf-182	Unlimited	Unlimited	1×10^2	1×10^6
Mercury (80)				
Hg-194 (a)	1×10^0	1×10^0	1×10^1	1×10^6
Hg-195m (a)	3×10^0	7×10^{-1}	1×10^2	1×10^6
Hg-197	2×10^1	1×10^1	1×10^2	1×10^7
Hg-197m	1×10^1	4×10^{-1}	1×10^2	1×10^6
Hg-203	5×10^0	1×10^0	1×10^2	1×10^5
Holmium (67)				
Ho-166	4×10^{-1}	4×10^{-1}	1×10^3	1×10^5
Ho-166m	6×10^{-1}	5×10^{-1}	1×10^1	1×10^6
Iodine (53)				
I-123	6×10^0	3×10^0	1×10^2	1×10^7
I-124	1×10^0	1×10^0	1×10^1	1×10^6
I-125	2×10^1	3×10^0	1×10^3	1×10^6
I-126	2×10^0	1×10^0	1×10^2	1×10^6
I-129	Unlimited	Unlimited	1×10^2	1×10^5
I-131	3×10^0	7×10^{-1}	1×10^2	1×10^6
I-132	4×10^{-1}	4×10^{-1}	1×10^1	1×10^5
I-133	7×10^{-1}	6×10^{-1}	1×10^1	1×10^6
I-134	3×10^{-1}	3×10^{-1}	1×10^1	1×10^5
I-135 (a)	6×10^{-1}	6×10^{-1}	1×10^1	1×10^6
Indium (49)				
In-111	3×10^0	3×10^0	1×10^2	1×10^6
In-113m	4×10^0	2×10^0	1×10^2	1×10^6
In-114m (a)	1×10^1	5×10^{-1}	1×10^2	1×10^6
In-115m	7×10^0	1×10^0	1×10^2	1×10^6
Iridium (77)				
Ir-189 (a)	1×10^1	1×10^1	1×10^2	1×10^7

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Ir-190	7×10^{-1}	7×10^{-1}	1×10^1	1×10^6
Ir-192	$1 \times 10^0(c)$	6×10^{-1}	1×10^1	1×10^4
Ir-194	3×10^{-1}	3×10^{-1}	1×10^2	1×10^5
Potassium (19)				
K-40	9×10^{-1}	9×10^{-1}	1×10^2	1×10^6
K-42	2×10^{-1}	2×10^{-1}	1×10^2	1×10^6
K-43	7×10^{-1}	6×10^{-1}	1×10^1	1×10^6
Krypton (36)				
Kr-79	4×10^0	1×10^0	1×10^3	1×10^5
Kr-81	4×10^1	4×10^1	1×10^4	1×10^7
Kr-85	1×10^1	1×10^1	1×10^5	1×10^4
Kr-85m	8×10^0	3×10^0	1×10^3	1×10^{10}
Kr-87	2×10^{-1}	2×10^{-1}	1×10^2	1×10^9
Lanthanum (57)				
La-137	3×10^1	6×10^0	1×10^3	1×10^7
La-140	4×10^{-1}	4×10^{-1}	1×10^1	1×10^5
Lutetium (71)				
Lu-172	6×10^{-1}	6×10^{-1}	1×10^1	1×10^6
Lu-173	8×10^0	8×10^0	1×10^2	1×10^7
Lu-174	9×10^0	9×10^0	1×10^2	1×10^7
Lu-174m	2×10^1	1×10^1	1×10^2	1×10^7
Lu-177	3×10^1	7×10^{-1}	1×10^3	1×10^7
Magnesium (12)				
Mg-28 (a)	3×10^{-1}	3×10^{-1}	1×10^1	1×10^5
Manganese (25)				
Mn-52	3×10^{-1}	3×10^{-1}	1×10^1	1×10^5
Mn-53	Unlimited	Unlimited	1×10^4	1×10^9
Mn-54	1×10^0	1×10^0	1×10^1	1×10^6
Mn-56	3×10^{-1}	3×10^{-1}	1×10^1	1×10^5
Molybdenum (42)				
Mo-93	4×10^1	2×10^1	1×10^3	1×10^8

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Mo-99 (a)	1×10^0	6×10^{-1}	1×10^2	1×10^6
Nitrogen (7)				
N-13	9×10^{-1}	6×10^{-1}	1×10^2	1×10^9
Sodium (11)				
Na-22	5×10^{-1}	5×10^{-1}	1×10^1	1×10^6
Na-24	2×10^{-1}	2×10^{-1}	1×10^1	1×10^5
Niobium (41)				
Nb-93m	4×10^1	3×10^1	1×10^4	1×10^7
Nb-94	7×10^{-1}	7×10^{-1}	1×10^1	1×10^6
Nb-95	1×10^0	1×10^0	1×10^1	1×10^6
Nb-97	9×10^{-1}	6×10^{-1}	1×10^1	1×10^6
Neodymium (60)				
Nd-147	6×10^0	6×10^{-1}	1×10^2	1×10^6
Nd-149	6×10^{-1}	5×10^{-1}	1×10^2	1×10^6
Nickel (28)				
Ni-59	Unlimited	Unlimited	1×10^4	1×10^8
Ni-63	4×10^1	3×10^1	1×10^5	1×10^8
Ni-65	4×10^{-1}	4×10^{-1}	1×10^1	1×10^6
Neptunium (93)				
Np-235	4×10^1	4×10^1	1×10^3	1×10^7
Np-236(short-lived)	2×10^1	2×10^0	1×10^3	1×10^7
Np-236(long-lived)	9×10^0	2×10^{-2}	1×10^2	1×10^5
Np-237	2×10^1	2×10^{-3}	1×10^0 (b)	1×10^3 (b)
Np-239	7×10^0	4×10^{-1}	1×10^2	1×10^7
Osmium (76)				
Os-185	1×10^0	1×10^0	1×10^1	1×10^6
Os-191	1×10^1	2×10^0	1×10^2	1×10^7
Os-191m	4×10^1	3×10^1	1×10^3	1×10^7
Os-193	2×10^0	6×10^{-1}	1×10^2	1×10^6
Os-194 (a)	3×10^{-1}	3×10^{-1}	1×10^2	1×10^5
Phosphorus (15)				

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
P-32	5×10^{-1}	5×10^{-1}	1×10^3	1×10^5
P-33	4×10^1	1×10^0	1×10^5	1×10^8
Protactinium (91)				
Pa-230 (a)	2×10^0	7×10^{-2}	1×10^1	1×10^6
Pa-231	4×10^0	4×10^{-4}	1×10^0	1×10^3
Pa-233	5×10^0	7×10^{-1}	1×10^2	1×10^7
Lead (82)				
Pb-201	1×10^0	1×10^0	1×10^1	1×10^6
Pb-202	4×10^1	2×10^1	1×10^3	1×10^6
Pb-203	4×10^0	3×10^0	1×10^2	1×10^6
Pb-205	Unlimited	Unlimited	1×10^4	1×10^7
Pb-210 (a)	1×10^0	5×10^{-2}	1×10^1 (b)	1×10^4 (b)
Pb-212 (a)	7×10^{-1}	2×10^{-1}	1×10^1 (b)	1×10^5 (b)
Palladium (46)				
Pd-103 (a)	4×10^1	4×10^1	1×10^3	1×10^8
Pd-107	Unlimited	Unlimited	1×10^5	1×10^8
Pd-109	2×10^0	5×10^{-1}	1×10^3	1×10^6
Promethium (61)				
Pm-143	3×10^0	3×10^0	1×10^2	1×10^6
Pm-144	7×10^{-1}	7×10^{-1}	1×10^1	1×10^6
Pm-145	3×10^1	1×10^1	1×10^3	1×10^7
Pm-147	4×10^1	2×10^0	1×10^4	1×10^7
Pm-148m (a)	8×10^{-1}	7×10^{-1}	1×10^1	1×10^6
Pm-149	2×10^0	6×10^{-1}	1×10^3	1×10^6
Pm-151	2×10^0	6×10^{-1}	1×10^2	1×10^6
Polonium (84)				
Po-210	4×10^1	2×10^{-2}	1×10^1	1×10^4
Praseodymium (59)				
Pr-142	4×10^{-1}	4×10^{-1}	1×10^2	1×10^5
Pr-143	3×10^0	6×10^{-1}	1×10^4	1×10^6
Platinum (78)				

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Pt-188 (a)	1×10^0	8×10^{-1}	1×10^1	1×10^6
Pt-191	4×10^0	3×10^0	1×10^2	1×10^6
Pt-193	4×10^1	4×10^1	1×10^4	1×10^7
Pt-193m	4×10^1	5×10^{-1}	1×10^3	1×10^7
Pt-195m	1×10^1	5×10^{-1}	1×10^2	1×10^6
Pt-197	2×10^1	6×10^{-1}	1×10^3	1×10^6
Pt-197m	1×10^1	6×10^{-1}	1×10^2	1×10^6
Plutonium (94)				
Pu-236	3×10^1	3×10^{-3}	1×10^1	1×10^4
Pu-237	2×10^1	2×10^1	1×10^3	1×10^7
Pu-238	1×10^1	1×10^{-3}	1×10^0	1×10^4
Pu-239	1×10^1	1×10^{-3}	1×10^0	1×10^4
Pu-240	1×10^1	1×10^{-3}	1×10^0	1×10^3
Pu-241 (a)	4×10^1	6×10^{-2}	1×10^2	1×10^5
Pu-242	1×10^1	1×10^{-3}	1×10^0	1×10^4
Pu-244 (a)	4×10^{-1}	1×10^{-3}	1×10^0	1×10^4
Radium (88)				
Ra-223 (a)	4×10^{-1}	7×10^{-3}	1×10^2 (b)	1×10^5 (b)
Ra-224 (a)	4×10^{-1}	2×10^{-2}	1×10^1 (b)	1×10^5 (b)
Ra-225 (a)	2×10^{-1}	4×10^{-3}	1×10^2	1×10^5
Ra-226 (a)	2×10^{-1}	3×10^{-3}	1×10^1 (b)	1×10^4 (b)
Ra-228 (a)	6×10^{-1}	2×10^{-2}	1×10^1 (b)	1×10^5 (b)
Rubidium (37)				
Rb-81	2×10^0	8×10^{-1}	1×10^1	1×10^6
Rb-83 (a)	2×10^0	2×10^0	1×10^2	1×10^6
Rb-84	1×10^0	1×10^0	1×10^1	1×10^6
Rb-86	5×10^{-1}	5×10^{-1}	1×10^2	1×10^5
Rb-87	Unlimited	Unlimited	1×10^4	1×10^7
Rb(nat)	Unlimited	Unlimited	1×10^4	1×10^7
Rhenium (75)				
Re-184	1×10^0	1×10^0	1×10^1	1×10^6

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Re-184m	3×10^0	1×10^0	1×10^2	1×10^6
Re-186	2×10^0	6×10^{-1}	1×10^3	1×10^6
Re-187	Unlimited	Unlimited	1×10^6	1×10^9
Re-188	4×10^{-1}	4×10^{-1}	1×10^2	1×10^5
Re-189 (a)	3×10^0	6×10^{-1}	1×10^2	1×10^6
Re(nat)	Unlimited	Unlimited	1×10^6	1×10^9
Rhodium (45)				
Rh-99	2×10^0	2×10^0	1×10^1	1×10^6
Rh-101	4×10^0	3×10^0	1×10^2	1×10^7
Rh-102	5×10^{-1}	5×10^{-1}	1×10^1	1×10^6
Rh-102m	2×10^0	2×10^0	1×10^2	1×10^6
Rh-103m	4×10^1	4×10^1	1×10^4	1×10^8
Rh-105	1×10^1	8×10^{-1}	1×10^2	1×10^7
Radon (86)				
Rn-222 (a)	3×10^{-1}	4×10^{-3}	1×10^1 (b)	1×10^8 (b)
Ruthenium (44)				
Ru-97	5×10^0	5×10^0	1×10^2	1×10^7
Ru-103 (a)	2×10^0	2×10^0	1×10^2	1×10^6
Ru-105	1×10^0	6×10^{-1}	1×10^1	1×10^6
Ru-106 (a)	2×10^{-1}	2×10^{-1}	1×10^2 (b)	1×10^5 (b)
Sulphur (16)				
S-35	4×10^1	3×10^0	1×10^5	1×10^8
Antimony (51)				
Sb-122	4×10^{-1}	4×10^{-1}	1×10^2	1×10^4
Sb-124	6×10^{-1}	6×10^{-1}	1×10^1	1×10^6
Sb-125	2×10^0	1×10^0	1×10^2	1×10^6
Sb-126	4×10^{-1}	4×10^{-1}	1×10^1	1×10^5
Scandium (21)				
Sc-44	5×10^{-1}	5×10^{-1}	1×10^1	1×10^5
Sc-46	5×10^{-1}	5×10^{-1}	1×10^1	1×10^6
Sc-47	1×10^1	7×10^{-1}	1×10^2	1×10^6

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Sc-48	3×10^{-1}	3×10^{-1}	1×10^1	1×10^5
Selenium (34)				
Se-75	3×10^0	3×10^0	1×10^2	1×10^6
Se-79	4×10^1	2×10^0	1×10^4	1×10^7
Silicon (14)				
Si-31	6×10^{-1}	6×10^{-1}	1×10^3	1×10^6
Si-32	4×10^1	5×10^{-1}	1×10^3	1×10^6
Samarium (62)				
Sm-145	1×10^1	1×10^1	1×10^2	1×10^7
Sm-147	Unlimited	Unlimited	1×10^1	1×10^4
Sm-151	4×10^1	1×10^1	1×10^4	1×10^8
Sm-153	9×10^0	6×10^{-1}	1×10^2	1×10^6
Tin (50)				
Sn-113 (a)	4×10^0	2×10^0	1×10^3	1×10^7
Sn-117m	7×10^0	4×10^{-1}	1×10^2	1×10^6
Sn-119m	4×10^1	3×10^1	1×10^3	1×10^7
Sn-121m (a)	4×10^1	9×10^{-1}	1×10^3	1×10^7
Sn-123	8×10^{-1}	6×10^{-1}	1×10^3	1×10^6
Sn-125	4×10^{-1}	4×10^{-1}	1×10^2	1×10^5
Sn-126 (a)	6×10^{-1}	4×10^{-1}	1×10^1	1×10^5
Strontium (38)				
Sr-82 (a)	2×10^{-1}	2×10^{-1}	1×10^1	1×10^5
Sr-85	2×10^0	2×10^0	1×10^2	1×10^6
Sr-85m	5×10^0	5×10^0	1×10^2	1×10^7
Sr-87m	3×10^0	3×10^0	1×10^2	1×10^6
Sr-89	6×10^{-1}	6×10^{-1}	1×10^3	1×10^6
Sr-90 (a)	3×10^{-1}	3×10^{-1}	1×10^2 (b)	1×10^4 (b)
Sr-91 (a)	3×10^{-1}	3×10^{-1}	1×10^1	1×10^5
Sr-92 (a)	1×10^0	3×10^{-1}	1×10^1	1×10^6
Tritium (1)				
T(H-3)	4×10^1	4×10^1	1×10^6	1×10^9

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Tantalum (73)				
Ta-178(long-lived)	1×10^0	8×10^{-1}	1×10^1	1×10^6
Ta-179	3×10^1	3×10^1	1×10^3	1×10^7
Ta-182	9×10^{-1}	5×10^{-1}	1×10^1	1×10^4
Terbium (65)				
Tb-157	4×10^1	4×10^1	1×10^4	1×10^7
Tb-158	1×10^0	1×10^0	1×10^1	1×10^6
Tb-160	1×10^0	6×10^{-1}	1×10^1	1×10^6
Technetium (43)				
Tc-95m (a)	2×10^0	2×10^0	1×10^1	1×10^6
Tc-96	4×10^{-1}	4×10^{-1}	1×10^1	1×10^6
Tc-96m (a)	4×10^{-1}	4×10^{-1}	1×10^3	1×10^7
Tc-97	Unlimited	Unlimited	1×10^3	1×10^8
Tc-97m	4×10^1	1×10^0	1×10^3	1×10^7
Tc-98	8×10^{-1}	7×10^{-1}	1×10^1	1×10^6
Tc-99	4×10^1	9×10^{-1}	1×10^4	1×10^7
Tc-99m	1×10^1	4×10^0	1×10^2	1×10^7
Tellurium (52)				
Te-121	2×10^0	2×10^0	1×10^1	1×10^6
Te-121m	5×10^0	3×10^0	1×10^2	1×10^6
Te-123m	8×10^0	1×10^0	1×10^2	1×10^7
Te-125m	2×10^1	9×10^{-1}	1×10^3	1×10^7
Te-127	2×10^1	7×10^{-1}	1×10^3	1×10^6
Te-127m (a)	2×10^1	5×10^{-1}	1×10^3	1×10^7
Te-129	7×10^{-1}	6×10^{-1}	1×10^2	1×10^6
Te-129m (a)	8×10^{-1}	4×10^{-1}	1×10^3	1×10^6
Te-131m (a)	7×10^{-1}	5×10^{-1}	1×10^1	1×10^6
Te-132 (a)	5×10^{-1}	4×10^{-1}	1×10^2	1×10^7
Thorium (90)				
Th-227	1×10^1	5×10^{-3}	1×10^1	1×10^4
Th-228 (a)	5×10^{-1}	1×10^{-3}	1×10^0 (b)	1×10^4 (b)

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Th-229	5×10^0	5×10^{-4}	1×10^0 (b)	1×10^3 (b)
Th-230	1×10^1	1×10^{-3}	1×10^0	1×10^4
Th-231	4×10^1	2×10^{-2}	1×10^3	1×10^7
Th-232	Unlimited	Unlimited	1×10^1	1×10^4
Th-234 (a)	3×10^{-1}	3×10^{-1}	1×10^3 (b)	1×10^5 (b)
Th(nat)	Unlimited	Unlimited	1×10^0 (b)	1×10^3 (b)
Titanium (22)				
Ti-44 (a)	5×10^{-1}	4×10^{-1}	1×10^1	1×10^5
Thallium (81)				
Tl-200	9×10^{-1}	9×10^{-1}	1×10^1	1×10^6
Tl-201	1×10^1	4×10^0	1×10^2	1×10^6
Tl-202	2×10^0	2×10^0	1×10^2	1×10^6
Tl-204	1×10^1	7×10^{-1}	1×10^4	1×10^4
Thulium (69)				
Tm-167	7×10^0	8×10^{-1}	1×10^2	1×10^6
Tm-170	3×10^0	6×10^{-1}	1×10^3	1×10^6
Tm-171	4×10^1	4×10^1	1×10^4	1×10^8
Uranium (92)				
U-230 (fast lung absorption) (a)(d)	4×10^1	1×10^{-1}	1×10^1 (b)	1×10^5 (b)
U-230 (medium lung absorption) (a)(e)	4×10^1	4×10^{-3}	1×10^1	1×10^4
U-230 (slow lung absorption) (a)(f)	3×10^1	3×10^{-3}	1×10^1	1×10^4
U-232 (fast lung absorption) (d)	4×10^1	1×10^{-2}	1×10^0 (b)	1×10^3 (b)
U-232 (medium lung absorption) (e)	4×10^1	7×10^{-3}	1×10^1	1×10^4
U-232 (slow lung absorption) (f)	1×10^1	1×10^{-3}	1×10^1	1×10^4
U-233 (fast lung absorption) (d)	4×10^1	9×10^{-2}	1×10^1	1×10^4
U-233 (medium lung absorption) (e)	4×10^1	2×10^{-2}	1×10^2	1×10^5
U-233 (slow lung absorption) (f)	4×10^1	6×10^{-3}	1×10^1	1×10^5
U-234 (fast lung absorption) (d)	4×10^1	9×10^{-2}	1×10^1	1×10^4
U-234 (medium lung absorption) (e)	4×10^1	2×10^{-2}	1×10^2	1×10^5
U-234 (slow lung absorption) (f)	4×10^1	6×10^{-3}	1×10^1	1×10^5
U-235 (all lung absorption types)	Unlimited	Unlimited	1×10^1 (b)	1×10^4 (b)

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
(a)(d)(e)(f)				
U-236 (fast lung absorption) (d)	Unlimited	Unlimited	1×10^1	1×10^4
U-236 (medium lung absorption) (e)	4×10^1	2×10^{-2}	1×10^2	1×10^5
U-236 (slow lung absorption) (f)	4×10^1	6×10^{-3}	1×10^1	1×10^4
U-238 (all lung absorption types) (d)(e)(f)	Unlimited	Unlimited	1×10^1 (b)	1×10^4 (b)
U (nat)	Unlimited	Unlimited	1×10^0 (b)	1×10^3 (b)
U (enriched to 20% or less) (g)	Unlimited	Unlimited	1×10^0	1×10^3
U (dep)	Unlimited	Unlimited	1×10^0	1×10^3
Vanadium (23)				
V-48	4×10^{-1}	4×10^{-1}	1×10^1	1×10^5
V-49	4×10^1	4×10^1	1×10^4	1×10^7
Tungsten (74)				
W-178 (a)	9×10^0	5×10^0	1×10^1	1×10^6
W-181	3×10^1	3×10^1	1×10^3	1×10^7
W-185	4×10^1	8×10^{-1}	1×10^4	1×10^7
W-187	2×10^0	6×10^{-1}	1×10^2	1×10^6
W-188 (a)	4×10^{-1}	3×10^{-1}	1×10^2	1×10^5
Xenon (54)				
Xe-122 (a)	4×10^{-1}	4×10^{-1}	1×10^2	1×10^9
Xe-123	2×10^0	7×10^{-1}	1×10^2	1×10^9
Xe-127	4×10^0	2×10^0	1×10^3	1×10^5
Xe-131m	4×10^1	4×10^1	1×10^4	1×10^4
Xe-133	2×10^1	1×10^1	1×10^3	1×10^4
Xe-135	3×10^0	2×10^0	1×10^3	1×10^{10}
Yttrium (39)				
Y-87 (a)	1×10^0	1×10^0	1×10^1	1×10^6
Y-88	4×10^{-1}	4×10^{-1}	1×10^1	1×10^6
Y-90	3×10^{-1}	3×10^{-1}	1×10^3	1×10^5
Y-91	6×10^{-1}	6×10^{-1}	1×10^3	1×10^6
Y-91m	2×10^0	2×10^0	1×10^2	1×10^6

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Y-92	2×10^{-1}	2×10^{-1}	1×10^2	1×10^5
Y-93	3×10^{-1}	3×10^{-1}	1×10^2	1×10^5
Ytterbium (70)				
Yb-169	4×10^0	1×10^0	1×10^2	1×10^7
Yb-175	3×10^1	9×10^{-1}	1×10^3	1×10^7
Zinc (30)				
Zn-65	2×10^0	2×10^0	1×10^1	1×10^6
Zn-69	3×10^0	6×10^{-1}	1×10^4	1×10^6
Zn-69m (a)	3×10^0	6×10^{-1}	1×10^2	1×10^6
Zirconium (40)				
Zr-88	3×10^0	3×10^0	1×10^2	1×10^6
Zr-93	Unlimited	Unlimited	1×10^3 (b)	1×10^7 (b)
Zr-95 (a)	2×10^0	8×10^{-1}	1×10^1	1×10^6
Zr-97 (a)	4×10^{-1}	4×10^{-1}	1×10^1 (b)	1×10^5 (b)

(a) A_1 and/or A_2 values for these parent radionuclides include contributions from daughter radionuclides with half-lives less than 10 days, as listed in the following:

Mg-28	Al-28
Ar-42	K-42
Ca-47	Sc-47
Ti-44	Sc-44
Fe-52	Mn-52m
Fe-60	Co-60m
Zn-69m	Zn-69
Ge-68	Ga-68
Rb-83	Kr-83m
Sr-82	Rb-82
Sr-90	Y-90
Sr-91	Y-91m
Sr-92	Y-92
Y-87	Sr-87m
Zr-95	Nb-95m
Zr-97	Nb-97m, Nb-97
Mo-99	Tc-99m
Tc-95m	Tc-95
Tc-96m	Tc-96
Ru-103	Rh-103m
Ru-106	Rh-106
Pd-103	Rh-103m
Ag-108m	Ag-108
Ag-110m	Ag-110

Cd-115	In-115m
In-114m	In-114
Sn-113	In-113m
Sn-121m	Sn-121
Sn-126	Sb-126m
Te-118	Sb-118
Te-127m	Te-127
Te-129m	Te-129
Te-131m	Te-131
Te-132	I-132
I-135	Xe-135m
Xe-122	I-122
Cs-137	Ba-137m
Ba-131	Cs-131
Ba-140	La-140
Ce-144	Pr-144m, Pr-144
Pm-148m	Pm-148
Gd-146	Eu-146
Dy-166	Ho-166
Hf-172	Lu-172
W-178	Ta-178
W-188	Re-188
Re-189	Os-189m
Os-194	Ir-194
Ir-189	Os-189m
Pt-188	Ir-188
Hg-194	Au-194
Hg-195m	Hg-195
Pb-210	Bi-210
Pb-212	Bi-212, Tl-208, Po-212
Bi-210m	Tl-206
Bi-212	Tl-208, Po-212
At-211	Po-211
Rn-222	Po-218, Pb-214, At-218, Bi-214, Po-214
Ra-223	Rn-219, Po-215, Pb-211, Bi-211, Po-211, Tl-207
Ra-224	Rn-220, Po-216, Pb-212, Bi-212, Tl-208, Po-212
Ra-225	Ac-225, Fr-221, At-217, Bi-213, Tl-209, Po-213, Pb-209
Ra-226	Rn-222, Po-218, Pb-214, At-218, Bi-214, Po-214
Ra-228	Ac-228
Ac-225	Fr-221, At-217, Bi-213, Tl-209, Po-213, Pb-209
Ac-227	Fr-223
Th-228	Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208, Po-212
Th-234	Pa-234m, Pa-234
Pa-230	Ac-226, Th-226, Fr-222, Ra-222, Rn-218, Po-214
U-230	Th-226, Ra-222, Rn-218, Po-214
U-235	Th-231
Pu-241	U-237
Pu-244	U-240, Np-240m
Am-242m	Am-242, Np-238
Am-243	Np-239
Cm-247	Pu-243
Bk-249	Am-245
Cf-253	Cm-249

- (b) Parent nuclides and their progeny included in secular equilibrium are listed in the following:

Sr-90	Y-90
Zr-93	Nb-93m
Zr-97	Nb-97
Ru-106	Rh-106
Ag-108m	Ag-108
Cs-137	Ba-137m
Ce-144	Pr-144
Ba-140	La-140
Bi-212	Tl-208 (0.36), Po-212 (0.64)
Pb-210	Bi-210, Po-210
Pb-212	Bi-212, Tl-208 (0.36), Po-212 (0.64)
Rn-222	Po-218, Pb-214, Bi-214, Po-214
Ra-223	Rn-219, Po-215, Pb-211, Bi-211, Tl-207
Ra-224	Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)
Ra-226	Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210
Ra-228	Ac-228
Th-228	Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)
Th-229	Ra-225, Ac-225, Fr-221, At-217, Bi-213, Po-213, Pb-209
Th-nat	Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)
Th-234	Pa-234m
U-230	Th-226, Ra-222, Rn-218, Po-214
U-232	Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)
U-235	Th-231
U-238	Th-234, Pa-234m
U-nat	Th-234, Pa-234m, U-234, Th-230, Ra-226, Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210
	Np-237 Pa-233
Am-242m	Am-242
Am-243	Np-239

- (c) The quantity may be determined from a measurement of the rate of decay or a measurement of the radiation level at a prescribed distance from the source.
- (d) These values apply only to compounds of uranium that take the chemical form of UF_6 , UO_2F_2 and $\text{UO}_2(\text{NO}_3)_2$ in both normal and accident conditions of carriage.
- (e) These values apply only to compounds of uranium that take the chemical form of UO_3 , UF_4 , UCl_4 and hexavalent compounds in both normal and accident conditions of carriage.
- (f) These values apply to all compounds of uranium other than those specified in (d) and (e) above.
- (g) These values apply to unirradiated uranium only.

2.2.7.2.2.2 For individual radionuclides which are not listed in Table 2.2.7.2.2.1 the determination of the basic radionuclide values referred to in 2.2.7.2.2.1 shall require multilateral approval. It is permissible to use an A_2 value calculated using a dose coefficient for the appropriate lung absorption type as recommended by the International Commission on Radiological Protection, if the chemical forms of each radionuclide under both normal and accident conditions of carriage are taken into consideration. Alternatively, the radionuclide values in Table 2.2.7.2.2.2 may be used without obtaining competent authority approval.

Table 2.2.7.2.2.2: Basic radionuclide values for unknown radionuclides or mixtures

Radioactive contents	A_1	A_2	Activity concentration for exempt material	Activity limit for exempt consignments
	(TBq)	(TBq)	(Bq/g)	(Bq)
Only beta or gamma emitting nuclides are known to be present	0.1	0.02	1×10^1	1×10^4
Alpha emitting nuclides but no neutron emitters are known to be present	0.2	9×10^{-5}	1×10^{-1}	1×10^3
Neutron emitting nuclides are known to be present or no relevant data are available	0.001	9×10^{-5}	1×10^{-1}	1×10^3

2.2.7.2.2.3 In the calculations of A_1 and A_2 for a radionuclide not in Table 2.2.7.2.2.1, a single radioactive decay chain in which the radionuclides are present in their naturally occurring proportions, and in which no daughter nuclide has a half-life either longer than 10 days or longer than that of the parent nuclide, shall be considered as a single radionuclide; and the activity to be taken into account and the A_1 or A_2 value to be applied shall be those corresponding to the parent nuclide of that chain. In the case of radioactive decay chains in which any daughter nuclide has a half-life either longer than 10 days or greater than that of the parent nuclide, the parent and such daughter nuclides shall be considered as mixtures of different nuclides.

- 2.2.7.2.2.4 For mixtures of radionuclides, the determination of the basic radionuclide values referred to in 2.2.7.2.2.1 may be determined as follows:

$$X_m = \frac{1}{\sum_i \frac{f(i)}{X(i)}}$$

where,

- f(i) is the fraction of activity or activity concentration of radionuclide i in the mixture;
- X(i) is the appropriate value of A₁ or A₂, or the activity concentration for exempt material or the activity limit for an exempt consignment as appropriate for the radionuclide i; and
- X_m is the derived value of A₁ or A₂, or the activity concentration for exempt material or the activity limit for an exempt consignment in the case of a mixture.

- 2.2.7.2.2.5 When the identity of each radionuclide is known but the individual activities of some of the radionuclides are not known, the radionuclides may be grouped and the lowest radionuclide value, as appropriate, for the radionuclides in each group may be used in applying the formulas in 2.2.7.2.2.4 and 2.2.7.2.4.4. Groups may be based on the total alpha activity and the total beta/gamma activity when these are known, using the lowest radionuclide values for the alpha emitters or beta/gamma emitters, respectively.

- 2.2.7.2.2.6 For individual radionuclides or for mixtures of radionuclides for which relevant data are not available, the values shown in Table 2.2.7.2.2.2 shall be used.

2.2.7.2.3 *Determination of other material characteristics*

2.2.7.2.3.1 Low specific activity (LSA) material

2.2.7.2.3.1.1 *(Reserved)*

2.2.7.2.3.1.2 LSA material shall be in one of three groups:

- (a) LSA-I
- (i) uranium and thorium ores and concentrates of such ores, and other ores containing naturally occurring radionuclides which are intended to be processed for the use of these radionuclides;
 - (ii) natural uranium, depleted uranium, natural thorium or their compounds or mixtures, providing they are unirradiated and in solid or liquid form;
 - (iii) radioactive material for which the A₂ value is unlimited, excluding material classified as fissile according to 2.2.7.2.3.5; or
 - (iv) other radioactive material in which the activity is distributed throughout and the estimated average specific activity does not exceed 30 times the values for activity concentration specified in 2.2.7.2.2.1 to 2.2.7.2.2.6, excluding material classified as fissile according to 2.2.7.2.3.5;
- (b) LSA-II

- (i) water with tritium concentration up to 0.8 TBq/l; or
 - (ii) other material in which the activity is distributed throughout and the estimated average specific activity does not exceed $10^{-4} A_2/g$ for solids and gases, and $10^{-5} A_2/g$ for liquids;
- (c) LSA-III - Solids (e.g. consolidated wastes, activated materials), excluding powders, in which:
- (i) the radioactive material is distributed throughout a solid or a collection of solid objects, or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen, ceramic, etc.);
 - (ii) the radioactive material is relatively insoluble, or it is intrinsically contained in a relatively insoluble matrix, so that, even under loss of packaging, the loss of radioactive material per package by leaching when placed in water for seven days would not exceed $0.1 A_2$; and
 - (iii) the estimated average specific activity of the solid, excluding any shielding material, does not exceed $2 \cdot 10^{-3} A_2/g$.

2.2.7.2.3.1.3 LSA-III material shall be a solid of such a nature that if the entire contents of a package were subjected to the test specified in 2.2.7.2.3.1.4 the activity in the water would not exceed $0.1 A_2$.

2.2.7.2.3.1.4 LSA-III material shall be tested as follows:

A solid material sample representing the entire contents of the package shall be immersed for 7 days in water at ambient temperature. The volume of water to be used in the test shall be sufficient to ensure that at the end of the 7 day test period the free volume of the unabsorbed and unreacted water remaining shall be at least 10% of the volume of the solid test sample itself. The water shall have an initial pH of 6-8 and a maximum conductivity of 1 mS/m at 20 °C. The total activity of the free volume of water shall be measured following the 7 day immersion of the test sample.

2.2.7.2.3.1.5 Demonstration of compliance with the performance standards in 2.2.7.2.3.1.4 shall be in accordance with 6.4.12.1 and 6.4.12.2 of ADR.

2.2.7.2.3.2 Surface contaminated object (SCO)

SCO is classified in one of two groups:

- (a) SCO-I: A solid object on which:
- (i) the non-fixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 4 Bq/cm^2 for beta and gamma emitters and low toxicity alpha emitters, or 0.4 Bq/cm^2 for all other alpha emitters; and
 - (ii) the fixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed $4 \times 10^4 \text{ Bq/cm}^2$ for beta and gamma emitters and low toxicity alpha emitters, or $4 \times 10^3 \text{ Bq/cm}^2$ for all other alpha emitters; and
 - (iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2)

does not exceed 4×10^4 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 4×10^3 Bq/cm² for all other alpha emitters;

- (b) SCO-II: A solid object on which either the fixed or non-fixed contamination on the surface exceeds the applicable limits specified for SCO-I in (a) above and on which:
- (i) the non-fixed contamination on the accessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 400 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 40 Bq/cm² for all other alpha emitters; and
 - (ii) the fixed contamination on the accessible surface, averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 8×10^5 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 8×10^4 Bq/cm² for all other alpha emitters; and
 - (iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 8×10^5 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters, or 8×10^4 Bq/cm² for all other alpha emitters.

2.2.7.2.3.3 Special form radioactive material

2.2.7.2.3.3.1 Special form radioactive material shall have at least one dimension not less than 5 mm. When a sealed capsule constitutes part of the special form radioactive material, the capsule shall be so manufactured that it can be opened only by destroying it. The design for special form radioactive material requires unilateral approval.

2.2.7.2.3.3.2 Special form radioactive material shall be of such a nature or shall be so designed that if it is subjected to the tests specified in 2.2.7.2.3.3.4 to 2.2.7.2.3.3.8, it shall meet the following requirements:

- (a) It would not break or shatter under the impact, percussion and bending tests 2.2.7.2.3.3.5 (a), (b), (c), 2.2.7.2.3.3.6 (a) as applicable;
- (b) It would not melt or disperse in the applicable heat test 2.2.7.2.3.3.5 (d) or 2.2.7.2.3.3.6 (b) as applicable; and
- (c) The activity in the water from the leaching tests specified in 2.2.7.2.3.3.7 and 2.2.7.2.3.3.8 would not exceed 2 kBq; or alternatively for sealed sources, the leakage rate for the volumetric leakage assessment test specified in ISO 9978:1992 "Radiation Protection - Sealed Radioactive Sources - Leakage Test Methods", would not exceed the applicable acceptance threshold acceptable to the competent authority.

2.2.7.2.3.3.3 Demonstration of compliance with the performance standards in 2.2.7.2.3.3.2 shall be in accordance with 6.4.12.1 and 6.4.12.2 of ADR.

2.2.7.2.3.3.4 Specimens that comprise or simulate special form radioactive material shall be subjected to the impact test, the percussion test, the bending test, and the heat test specified in 2.2.7.2.3.3.5 or alternative tests as authorized in 2.2.7.2.3.3.6. A different specimen may be used for each of the tests. Following each test, a leaching assessment or volumetric leakage test shall be performed on the specimen by a method no less sensitive than the methods given in 2.2.7.2.3.3.7 for indispersible solid material or 2.2.7.2.3.3.8 for encapsulated material.

2.2.7.2.3.3.5 The relevant test methods are:

- (a) Impact test: The specimen shall drop onto the target from a height of 9 m. The target shall be as defined in 6.4.14 of ADR;
- (b) Percussion test: The specimen shall be placed on a sheet of lead which is supported by a smooth solid surface and struck by the flat face of a mild steel bar so as to cause an impact equivalent to that resulting from a free drop of 1.4 kg through 1 m. The lower part of the bar shall be 25 mm in diameter with the edges rounded off to a radius of (3.0 ± 0.3) mm. The lead, of hardness number 3.5 to 4.5 on the Vickers scale and not more than 25 mm thick, shall cover an area greater than that covered by the specimen. A fresh surface of lead shall be used for each impact. The bar shall strike the specimen so as to cause maximum damage;
- (c) Bending test: The test shall apply only to long, slender sources with both a minimum length of 10 cm and a length to minimum width ratio of not less than 10. The specimen shall be rigidly clamped in a horizontal position so that one half of its length protrudes from the face of the clamp. The orientation of the specimen shall be such that the specimen will suffer maximum damage when its free end is struck by the flat face of a steel bar. The bar shall strike the specimen so as to cause an impact equivalent to that resulting from a free vertical drop of 1.4 kg through 1 m. The lower part of the bar shall be 25 mm in diameter with the edges rounded off to a radius of (3.0 ± 0.3) mm;
- (d) Heat test: The specimen shall be heated in air to a temperature of 800 °C and held at that temperature for a period of 10 minutes and shall then be allowed to cool.

2.2.7.2.3.3.6 Specimens that comprise or simulate radioactive material enclosed in a sealed capsule may be exempted from:

- (a) The tests prescribed in 2.2.7.2.3.3.5 (a) and (b) provided the mass of the special form radioactive material:
 - (i) is less than 200 g and they are alternatively subjected to the Class 4 impact test prescribed in ISO 2919:1999 “Radiation protection - Sealed radioactive sources - General requirements and classification”; or
 - (ii) is less than 500 g and they are alternatively subjected to the Class 5 impact test prescribed in ISO 2919:1999 “Radiation protection - Sealed radioactive sources - General requirements and classification”; and
- (b) The test prescribed in 2.2.7.2.3.3.5 (d) provided they are alternatively subjected to the Class 6 temperature test specified in ISO 2919:1999 “Radiation protection - Sealed radioactive sources - General requirements and classification”.

2.2.7.2.3.3.7 For specimens which comprise or simulate indispersible solid material, a leaching assessment shall be performed as follows:

- (a) The specimen shall be immersed for 7 days in water at ambient temperature. The volume of water to be used in the test shall be sufficient to ensure that at the end of the 7 day test period the free volume of the unabsorbed and unreacted water remaining shall be at least 10% of the volume of the solid test sample itself. The water shall have an initial pH of 6-8 and a maximum conductivity of 1 mS/m at 20 °C;
- (b) The water with specimen shall then be heated to a temperature of (50 ± 5) °C and maintained at this temperature for 4 hours;

- (c) The activity of the water shall then be determined;
- (d) The specimen shall then be kept for at least 7 days in still air at not less than 30 °C and relative humidity not less than 90%;
- (e) The specimen shall then be immersed in water of the same specification as in (a) above and the water with the specimen heated to (50 ± 5) °C and maintained at this temperature for 4 hours;
- (f) The activity of the water shall then be determined.

2.2.7.2.3.3.8 For specimens which comprise or simulate radioactive material enclosed in a sealed capsule, either a leaching assessment or a volumetric leakage assessment shall be performed as follows:

- (a) The leaching assessment shall consist of the following steps:
 - (i) the specimen shall be immersed in water at ambient temperature. The water shall have an initial pH of 6-8 with a maximum conductivity of 1 mS/m at 20 C;
 - (ii) the water and specimen shall be heated to a temperature of (50 ± 5) °C and maintained at this temperature for 4 hours;
 - (iii) the activity of the water shall then be determined;
 - (iv) the specimen shall then be kept for at least 7 days in still air at not less than 30°C and relative humidity of not less than 90%;
 - (v) the process in (i), (ii) and (iii) shall be repeated;
- (b) The alternative volumetric leakage assessment shall comprise any of the tests prescribed in ISO 9978:1992 "Radiation Protection - Sealed radioactive sources - Leakage test methods", which are acceptable to the competent authority.

2.2.7.2.3.4 Low dispersible radioactive material

2.2.7.2.3.4.1 The design for low dispersible radioactive material shall require multilateral approval. Low dispersible radioactive material shall be such that the total amount of this radioactive material in a package shall meet the following requirements:

- (a) The radiation level at 3 m from the unshielded radioactive material does not exceed 10 mSv/h;
- (b) If subjected to the tests specified in 6.4.20.3 and 6.4.20.4 of ADR, the airborne release in gaseous and particulate forms of up to 100 µm aerodynamic equivalent diameter would not exceed 100 A₂. A separate specimen may be used for each test; and
- (c) If subjected to the test specified in 2.2.7.2.3.1.4 the activity in the water would not exceed 100 A₂. In the application of this test, the damaging effects of the tests specified in (b) above shall be taken into account.

2.2.7.2.3.4.2 Low dispersible radioactive material shall be tested as follows:

A specimen that comprises or simulates low dispersible radioactive material shall be subjected to the enhanced thermal test specified in 6.4.20.3 of ADR and the impact test

specified in 6.4.20.4 of ADR. A different specimen may be used for each of the tests. Following each test, the specimen shall be subjected to the leach test specified in 2.2.7.2.3.1.4. After each test it shall be determined if the applicable requirements of 2.2.7.2.3.4.1 have been met.

2.2.7.2.3.4.3 Demonstration of compliance with the performance standards in 2.2.7.2.3.4.1 and 2.2.7.2.3.4.2 shall be in accordance with 6.4.12.1 and 6.4.12.2 of ADR.

2.2.7.2.3.5 Fissile material

Packages containing fissile radionuclides shall be classified under the relevant entry of table 2.2.7.2.1.1 for fissile material unless one of the conditions (a) to (d) of this paragraph is met. Only one type of exception is allowed per consignment.

(a) A mass limit per consignment such that:

$$\frac{\text{mass of uranium - 235 (g)}}{X} + \frac{\text{mass of other fissile material (g)}}{Y} < 1$$

where X and Y are the mass limits defined in Table 2.2.7.2.3.5, provided that the smallest external dimension of each package is not less than 10 cm and that either:

- (i) each individual package contains not more than 15 g of fissile material; for unpackaged material, this quantity limitation shall apply to the consignment being carried in or on the wagon/vehicle/conveyance; or
- (ii) the fissile material is a homogeneous hydrogenous solution or mixture where the ratio of fissile nuclides to hydrogen is less than 5% by mass; or
- (iii) there are not more than 5 g of fissile material in any 10 litre volume of material.

Neither beryllium nor deuterium shall be present in quantities exceeding 1% of the applicable consignment mass limits provided in Table 2.2.7.2.3.5, except for deuterium in natural concentration in hydrogen;

- (b) Uranium enriched in uranium-235 to a maximum of 1% by mass, and with a total plutonium and uranium-233 content not exceeding 1% of the mass of uranium-235, provided that the fissile material is distributed essentially homogeneously throughout the material. In addition, if uranium-235 is present in metallic, oxide or carbide forms, it shall not form a lattice arrangement;
- (c) Liquid solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2% by mass, with a total plutonium and uranium-233 content not exceeding 0.002% of the mass of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2;
- (d) Packages containing, individually, a total plutonium mass not more than 1 kg, of which not more than 20% by mass may consist of plutonium-239, plutonium-241 or any combination of those radionuclides.

Table 2.2.7.2.3.5: Consignment mass limits for exceptions from the requirements for packages containing fissile material

Fissile material	Fissile material mass (g) mixed with substances having an average hydrogen density less than or equal to water	Fissile material mass (g) mixed with substances having an average hydrogen density greater than water
Uranium-235 (X)	400	290
Other fissile material (Y)	250	180

2.2.7.2.4 Classification of packages or unpacked material

The quantity of radioactive material in a package shall not exceed the relevant limits for the package type as specified below.

2.2.7.2.4.1 Classification as excepted package**2.2.7.2.4.1.1 Packages may be classified as excepted packages if:**

- (a) They are empty packagings having contained radioactive material;
- (b) They contain instruments or articles in limited quantities;
- (c) They contain articles manufactured of natural uranium, depleted uranium or natural thorium; or
- (d) They contain radioactive material in limited quantities.

2.2.7.2.4.1.2 A package containing radioactive material may be classified as an excepted package provided that the radiation level at any point on its external surface does not exceed 5 μ Sv/h.**Table 2.2.7.2.4.1.2: Activity limits for excepted packages**

Physical state of contents	Instruments or article		Materials Package limits ^a
	Item limits ^a	Package limits ^a	
(1)	(2)	(3)	(4)
Solids			
special form	$10^{-2} A_1$	A_1	$10^{-3} A_1$
other form	$10^{-2} A_2$	A_2	$10^{-3} A_2$
Liquids	$10^{-3} A_2$	$10^{-1} A_2$	$10^{-4} A_2$
Gases			
Tritium	$2 \times 10^{-2} A_2$	$2 \times 10^{-1} A_2$	$2 \times 10^{-2} A_2$
special form	$10^{-3} A_1$	$10^{-2} A_1$	$10^{-3} A_1$
other forms	$10^{-3} A_2$	$10^{-2} A_2$	$10^{-3} A_2$

^a For mixtures of radionuclides, see 2.2.7.2.2.4 to 2.2.7.2.2.6.

2.2.7.2.4.1.3 Radioactive material which is enclosed in or is included as a component part of an instrument or other manufactured article may be classified under UN No. 2911 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - INSTRUMENTS or ARTICLES provided that:

- (a) The radiation level at 10 cm from any point on the external surface of any unpackaged instrument or article is not greater than 0.1 mSv/h; and

- (b) Each instrument or manufactured article bears the marking “RADIOACTIVE” except:
 - (i) radioluminescent time-pieces or devices;
 - (ii) consumer products that either have received regulatory approval according to 1.7.1.4 (d) or do not individually exceed the activity limit for an exempt consignment in Table 2.2.7.2.2.1 (column 5), provided such products are carried in a package that bears the marking “RADIOACTIVE” on an internal surface in such a manner that warning of the presence of radioactive material is visible on opening the package; and
- (c) The active material is completely enclosed by non-active components (a device performing the sole function of containing radioactive material shall not be considered to be an instrument or manufactured article); and
- (d) The limits specified in columns 2 and 3 of Table 2.2.7.2.4.1.2 are met for each individual item and each package, respectively.

2.2.7.2.4.1.4 Radioactive material with an activity not exceeding the limit specified in column 4 of Table 2.2.7.2.4.1.2, may be classified under UN No. 2910 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY OF MATERIAL provided that:

- (a) The package retains its radioactive contents under routine conditions of carriage; and
- (b) The package bears the marking “RADIOACTIVE” on an internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package.

2.2.7.2.4.1.5 An empty packaging which had previously contained radioactive material with an activity not exceeding the limit specified in column 4 of Table 2.2.7.2.4.1.2 may be classified under UN No. 2908 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - EMPTY PACKAGING, provided that:

- (a) It is in a well-maintained condition and securely closed;
- (b) The outer surface of any uranium or thorium in its structure is covered with an inactive sheath made of metal or some other substantial material;
- (c) The level of internal non-fixed contamination, when averaged over any 300 cm², does not exceed:
 - (i) 400 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters; and
 - (ii) 40 Bq/cm² for all other alpha emitters; and
- (d) Any labels which may have been displayed on it in conformity with 5.2.2.1.11.1 are no longer visible.

2.2.7.2.4.1.6 Articles manufactured of natural uranium, depleted uranium or natural thorium and articles in which the sole radioactive material is unirradiated natural uranium, unirradiated depleted uranium or unirradiated natural thorium may be classified under UN No. 2909 RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - ARTICLES MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or NATURAL THORIUM,

provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

2.2.7.2.4.2 Classification as Low specific activity (LSA) material

Radioactive material may only be classified as LSA material if the conditions of 2.2.7.2.3.1 and 4.1.9.2 of ADR are met.

2.2.7.2.4.3 Classification as Surface contaminated object (SCO)

Radioactive material may be classified as SCO if the conditions of 2.2.7.2.3.2 and 4.1.9.2 of ADR are met.

2.2.7.2.4.4 Classification as Type A package

Packages containing radioactive material may be classified as Type A packages provided that the following conditions are met:

Type A packages shall not contain activities greater than the following:

- (a) For special form radioactive material - A_1 ; or
- (b) For all other radioactive material - A_2 .

For mixtures of radionuclides whose identities and respective activities are known, the following condition shall apply to the radioactive contents of a Type A package:

$$\sum_i \frac{B(i)}{A_1(i)} + \sum_j \frac{C(j)}{A_2(j)} \leq 1$$

where $B(i)$ is the activity of radionuclide i as special form radioactive material;

$A_1(i)$ is the A_1 value for radionuclide i ;

$C(j)$ is the activity of radionuclide j as other than special form radioactive material; and

$A_2(j)$ is the A_2 value for radionuclide j .

2.2.7.2.4.5 Classification of Uranium hexafluoride

Uranium hexafluoride shall only be assigned to UN Nos. 2977 RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE, or 2978 RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, non-fissile or fissile-excepted.

2.2.7.2.4.5.1 Packages containing uranium hexafluoride shall not contain:

- (a) A mass of uranium hexafluoride different from that authorized for the package design;
- (b) A mass of uranium hexafluoride greater than a value that would lead to an ullage smaller than 5% at the maximum temperature of the package as specified for the plant systems where the package shall be used; or
- (c) Uranium hexafluoride other than in solid form or at an internal pressure above atmospheric pressure when presented for carriage.

2.2.7.2.4.6 Classification as Type B(U), Type B(M) or Type C packages

2.2.7.2.4.6.1 Packages not otherwise classified in 2.2.7.2.4 (2.2.7.2.4.1 to 2.2.7.2.4.5) shall be classified in accordance with the competent authority approval certificate for the package issued by the country of origin of design.

2.2.7.2.4.6.2 A package may only be classified as a Type B(U) if it does not contain:

- (a) Activities greater than those authorized for the package design;
- (b) Radionuclides different from those authorized for the package design; or
- (c) Contents in a form, or a physical or chemical state different from those authorized for the package design;

as specified in the certificate of approval.

2.2.7.2.4.6.3 A package may only be classified as a Type B(M) if it does not contain:

- (a) Activities greater than those authorized for the package design;
- (b) Radionuclides different from those authorized for the package design; or
- (c) Contents in a form, or a physical or chemical state different from those authorized for the package design;

as specified in the certificate of approval.

2.2.7.2.4.6.4 A package may only be classified as a Type C if it does not contain:

- (a) Activities greater than those authorized for the package design;
- (b) Radionuclides different from those authorized for the package design; or
- (c) Contents in a form, or physical or chemical state different from those authorized for the package design;

as specified in the certificate of approval.

2.2.7.2.5 *Special arrangements*

Radioactive material shall be classified as transported under special arrangement when it is intended to be carried in accordance with 1.7.4.

2.2.8 Class 8 Corrosive substances**2.2.8.1 Criteria**

2.2.8.1.1 The heading of Class 8 covers substances and articles containing substances of this class which by chemical action attack epithelial tissue - of skin or mucous membranes - with which they are in contact, or which in the event of leakage are capable of damaging or destroying other goods, or means of transport. The heading of this class also covers other substances which form a corrosive liquid only in the presence of water, or which produce corrosive vapour or mist in the presence of natural moisture of the air.

2.2.8.1.2 Substances and articles of Class 8 are subdivided as follows:

C1-C10 Corrosive substances without subsidiary risk:

C1-C4 Acid substances:

C1 Inorganic, liquid;

C2 Inorganic, solid;

C3 Organic, liquid;

C4 Organic, solid;

C5-C8 Basic substances:

C5 Inorganic, liquid;

C6 Inorganic, solid;

C7 Organic, liquid;

C8 Organic, solid;

C9-C10 Other corrosive substances:

C9 Liquid;

C10 Solid;

C11 Articles;

CF Corrosive substances, flammable:

CF1 Liquid;

CF2 Solid;

CS Corrosive substances, self-heating:

CS1 Liquid;

CS2 Solid;

CW Corrosive substances which, in contact with water, emit flammable gases:

CW1 Liquid;

CW2 Solid;

CO Corrosive substances, oxidizing:

CO1 Liquid;

CO2 Solid;

CT Corrosive substances, toxic:

CT1 Liquid;

CT2 Solid;

CFT	Corrosive substances, flammable, liquid, toxic;
COT	Corrosive substances, oxidizing, toxic.

Classification and assignment of packing groups

2.2.8.1.3 Substances of Class 8 shall be classified in three packing groups according to the degree of danger they present for carriage, as follows:

Packing group I:	highly corrosive substances
Packing group II:	corrosive substances
Packing group III:	slightly corrosive substances.

2.2.8.1.4 Substances and articles classified in Class 8 are listed in Table A of Chapter 3.2. Allocation of substances to packing groups I, II and III has been made on the basis of experience taking into account such additional factors as inhalation risk (see 2.2.8.1.5) and reactivity with water (including the formation of dangerous decomposition products).

2.2.8.1.5 A substance or preparation meeting the criteria of Class 8 having an inhalation toxicity of dusts and mists (LC₅₀) in the range of packing group I, but toxicity through oral ingestion or dermal contact only in the range of packing group III or less, shall be allocated to Class 8.

2.2.8.1.6 Substances, including mixtures, not mentioned by name in Table A of Chapter 3.2 can be assigned to the relevant entry of sub-section 2.2.8.3, and to the relevant packing group on the basis of the length of time of contact necessary to produce full thickness destruction of human skin in accordance with the criteria of (a) to (c) below.

Liquids, and solids which may become liquid during carriage, which are judged not to cause full thickness destruction of human skin shall still be considered for their potential to cause corrosion to certain metal surfaces. In assigning the packing group, account shall be taken of human experience in instances of accidental exposure. In the absence of human experience, the grouping shall be based on data obtained from experiments in accordance with OECD Guideline 404⁸.

- (a) Packing group I is assigned to substances that cause full thickness destruction of intact skin tissue within an observation period up to 60 minutes starting after the exposure time of 3 minutes or less.
- (b) Packing group II is assigned to substances that cause full thickness destruction of intact skin tissue within an observation period up to 14 days starting after the exposure time of more than 3 minutes but not more than 60 minutes.
- (c) Packing group III is assigned to substances that:
 - cause full thickness destruction of intact skin tissue within an observation period up to 14 days starting after the exposure time of more than 60 minutes but not more than 4 hours; or
 - are judged not to cause full thickness destruction of intact skin tissue, but which exhibit a corrosion rate on either steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55 °C when tested on both

⁸ OECD guidelines for Testing of Chemicals, No. 404 "Acute Dermal Irritation/Corrosion" (1992).

materials. For the purposes of testing steel, type S235JR+CR (1.0037 resp. St 37-2), S275J2G3+CR (1.0144 resp. St 44-3), ISO 3574, Unified Numbering System (UNS) G10200 or SAE 1020, and for testing aluminium, non-clad, types 7075-T6 or AZ5GU-T6 shall be used. An acceptable test is prescribed in the Manual of Tests and Criteria, Part III, Section 37.

NOTE: Where an initial test on either steel or aluminium indicates the substance being tested is corrosive the follow up test on the other metal is not required.

2.2.8.1.7 If substances of Class 8, as a result of admixtures, come into categories of risk different from those to which the substances mentioned by name in Table A of Chapter 3.2 belong, these mixtures or solutions shall be assigned to the entries to which they belong, on the basis of their actual degree of danger.

NOTE: For the classification of solutions and mixtures (such as preparations and wastes), see also 2.1.3.

2.2.8.1.8 On the basis of the criteria set out in paragraph 2.2.8.1.6, it may also be determined whether the nature of a solution or mixture mentioned by name or containing a substance mentioned by name is such that the solution or mixture is not subject to the provisions for this class.

2.2.8.1.9 Substances, solutions and mixtures, which

- do not meet the criteria of Directives 67/548/EEC³ or 1999/45/EC⁴ as amended and therefore are not classified as corrosive according to these directives, as amended; and
- do not exhibit a corrosive effect on steel or aluminium,

may be considered as substances not belonging to Class 8.

NOTE: UN No. 1910 calcium oxide and UN No. 2812 sodium aluminate, listed in the UN Model Regulations, are not subject to the provisions of ADN.

2.2.8.2 Substances not accepted for carriage

2.2.8.2.1 The chemically unstable substances of Class 8 shall not be accepted for carriage unless the necessary steps have been taken to prevent their dangerous decomposition or polymerization during carriage. To this end it shall in particular be ensured that receptacles and tanks do not contain any substance liable to promote these reactions.

2.2.8.2.2 The following substances shall not be accepted for carriage:

³ Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances (Official Journal of the European Communities No. L 196 of 16.08.1967, page 1).

⁴ Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 on the approximation of laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations (Official Journal of the European Communities No. L 200 of 30 July 1999, pages 1 to 68).

- UN No. 1798 NITROHYDROCHLORIC ACID;
- chemically unstable mixtures of spent sulphuric acid;
- chemically unstable mixtures of nitrating acid or mixtures of residual sulphuric and nitric acids, not denitrated;
- perchloric acid aqueous solution with more than 72 % pure acid, by mass, or mixtures of perchloric acid with any liquid other than water.

2.2.8.3 *List of collective entries***Corrosive substances without subsidiary risk**

Acid	inorganic	liquid C1	2584 ALKYL SULPHONIC ACIDS, LIQUID with more than 5% free sulphuric acid or 2584 ARYL SULPHONIC ACIDS, LIQUID with more than 5% free sulphuric acid 2693 BISULPHITES, AQUEOUS SOLUTION, N.O.S. 2837 BISULPHATES, AQUEOUS SOLUTION 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
		solid C2	1740 HYDROGEN DIFLUORIDES, SOLID, N.O.S. 2583 ALKYL SULPHONIC ACIDS, SOLID with more than 5% free sulphuric acid or 2583 ARYL SULPHONIC ACIDS, SOLID with more than 5% free sulphuric acid 3260 CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.
C1-C4	organic	liquid C3	2586 ALKYL SULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid or 2586 ARYL SULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid 2987 CHLOROSILANES, CORROSIVE, N.O.S. 3145 ALKYL PHENOLS, LIQUID, N.O.S. (including C ₂ -C ₁₂ homologues) 3265 CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
		solid C4	2430 ALKYL PHENOLS, SOLID, N.O.S. (including C ₂ -C ₁₂ homologues) 2585 ALKYL SULPHONIC ACIDS, SOLID with not more than 5% free sulphuric acid or 2585 ARYL SULPHONIC ACIDS, SOLID with not more than 5% free sulphuric acid 3261 CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.
Basic	inorganic	liquid C5	1719 CAUSTIC ALKALI LIQUID, N.O.S. 2797 BATTERY FLUID, ALKALI 3266 CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
		solid C6	3262 CORROSIVE SOLID, BASIC, INORGANIC, N.O.S.
C5-C8	organic	liquid C7	2735 AMINES, LIQUID, CORROSIVE, N.O.S. or 2735 POLYAMINES, LIQUID, CORROSIVE, N.O.S. 3267 CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.
		solid C8	3259 AMINES, SOLID, CORROSIVE, N.O.S., or 3259 POLYAMINES, SOLID, CORROSIVE, N.O.S. 3263 CORROSIVE SOLID, BASIC, ORGANIC, N.O.S.
Other corrosive substances C9-C10		liquid C9	1903 DISINFECTANT, LIQUID, CORROSIVE, N.O.S. 2801 DYE, LIQUID, CORROSIVE, N.O.S. or 2801 DYE INTERMEDIATE, LIQUID, CORROSIVE, N.O.S. 3066 PAINT (including paint, enamel, stain, shellac, varnish, polish, liquid filler and lacquer base) or 3066 PAINT RELATED MATERIAL (including paint thinning or reducing compound) 1760 CORROSIVE LIQUID, N.O.S.
		solid ^a C10	3147 DYE, SOLID, CORROSIVE, N.O.S. or 3147 DYE INTERMEDIATE, SOLID, CORROSIVE, N.O.S. 3244 SOLIDS CONTAINING CORROSIVE LIQUID, N.O.S. 1759 CORROSIVE SOLID, N.O.S.
Articles		C11	2794 BATTERIES, WET, FILLED WITH ACID, electric storage 2795 BATTERIES, WET, FILLED WITH ALKALI, electric storage 2800 BATTERIES, WET, NON-SPILLABLE, electric storage 3028 BATTERIES, DRY, CONTAINING POTASSIUM HYDROXIDE SOLID, electric storage

(cont'd on next page)

^a Mixtures of solids which are not subject to the provisions of ADN and of corrosive liquids may be carried under UN No. 3244 without being subject to the classification criteria of Class 8, provided there is no free liquid visible at the time the substance is loaded or at the time the packaging or cargo transport unit is closed. Each packaging shall correspond to a design type which has passed the leakproofness test for Packing group II level.

Corrosive substances with subsidiary risk(s)

(cont'd)	liquid	CF1	3470 PAINT, CORROSIVE, FLAMMABLE (including paint, enamel, stain, shellac, varnish, polish, liquid filler and lacquer base) or 3470 PAINT RELATED MATERIAL, CORROSIVE, FLAMMABLE (including paint thinning or reducing compound) 2734 AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. or 2734 POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. 2986 CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S. 2920 CORROSIVE LIQUID, FLAMMABLE, N.O.S.
Flammable^b			
CF	solid	CF2	2921 CORROSIVE SOLID, FLAMMABLE, N.O.S.
Self-heating	liquid	CS1	3301 CORROSIVE LIQUID, SELF-HEATING, N.O.S.
CS	solid	CS2	3095 CORROSIVE SOLID, SELF-HEATING, N.O.S.
Water-reactive	liquid^b	CW1	3094 CORROSIVE LIQUID, WATER-REACTIVE, N.O.S.
CW	solid	CW2	3096 CORROSIVE SOLID, WATER-REACTIVE, N.O.S.
Oxidizing	liquid	CO1	3093 CORROSIVE LIQUID, OXIDIZING, N.O.S.
CO	solid	CO2	3084 CORROSIVE SOLID, OXIDIZING, N.O.S.
Toxic^d	liquid^c	CT1	3471 HYDROGENDIFLUORIDES SOLUTION, N.O.S. 2922 CORROSIVE LIQUID, TOXIC, N.O.S.
CT	solid^e	CT2	2923 CORROSIVE SOLID, TOXIC, N.O.S.
Flammable, liquid, toxic^d		CF1	No collective entry with this classification code available; if need be, classification under a collective entry with a classification code to be determined according to table of precedence of hazard in 2.1.3.10.
Oxidizing, toxic^{d, e}		COT	No collective entry with this classification code available; if need be, classification under a collective entry with a classification code to be determined according to table of precedence of hazard in 2.1.3.10.

^b Chlorosilanes which, in contact with water or moist air, emit flammable gases, are substances of Class 4.3.

^c Chloroformates having predominantly toxic properties are substances of Class 6.1.

^d Corrosive substances which are highly toxic by inhalation, as defined in 2.2.61.1.4 to 2.2.61.1.9 are substances of Class 6.1.

^e UN No. 2505 AMMONIUM FLUORIDE, UN No. 1812 POTASSIUM FLUORIDE, UN No. 1690 SODIUM FLUORIDE, SOLID, UN No. 2674 SODIUM FLUOROSILICATE, UN No. 2856 FLUOROSILICATES, N.O.S., UN No. 3415 SODIUM FLUORIDE SOLUTION and UN No. 3422 POTASSIUM FLUORIDE SOLUTION are substances of Class 6.1.

2.2.9 Class 9 Miscellaneous dangerous substances and articles**2.2.9.1 Criteria**

2.2.9.1.1 The heading of Class 9 covers substances and articles which, during carriage, present a danger not covered by the heading of other classes.

2.2.9.1.2 The substances and articles of Class 9 are subdivided as follows:

M1 Substances which, on inhalation as fine dust, may endanger health;

M2 Substances and apparatus which, in the event of fire, may form dioxins;

M3 Substances evolving flammable vapour;

M4 Lithium batteries;

M5 Life-saving appliances;

M6-M8 Environmentally hazardous substances:

M6 Pollutant to the aquatic environment, liquid;

M7 Pollutant to the aquatic environment, solid;

M8 Genetically modified micro-organisms and organisms;

M9-M10 Elevated temperature substances:

M9 Liquid;

M10 Solid;

M11 Other substances presenting a danger during carriage, but not meeting the definitions of another class.

Definitions and classification

2.2.9.1.3 Substances and articles classified in Class 9 are listed in Table A of Chapter 3.2. The assignment of substances and articles not mentioned by name in Table A of Chapter 3.2 to the relevant entry of that Table or of sub-section 2.2.9.3 shall be done in accordance with 2.2.9.1.4 to 2.2.9.1.14 below.

Substances which, on inhalation as fine dust, may endanger health

2.2.9.1.4 Substances which, on inhalation as fine dust, may endanger health include asbestos and mixtures containing asbestos.

Substances and apparatus which, in the event of fire, may form dioxins

2.2.9.1.5 Substances and apparatus which, in the event of fire, may form dioxins include polychlorinated biphenyls (PCBs) and terphenyls (PCTs) and polyhalogenated biphenyls and terphenyls and mixtures containing these substances, as well as apparatus such as transformers, condensers and apparatus containing those substances or mixtures.

NOTE: *Mixtures with a PCB or PCT content of not more than 50 mg/kg are not subject to the provisions of ADN.*

Substances evolving flammable vapour

- 2.2.9.1.6 Substances evolving flammable vapour include polymers containing flammable liquids with a flash-point not exceeding 55 °C.

Lithium batteries

- 2.2.9.1.7 The term “lithium battery” covers all cells and batteries containing lithium in any form. They may be assigned to Class 9 if they meet the requirements of special provision 230 of Chapter 3.3. They are not subject to the provisions of ADN if they meet the requirements of special provision 188 of Chapter 3.3. They shall be classified in accordance with the procedures of Section 38.3 of the Manual of Tests and Criteria.

Life-saving appliances

- 2.2.9.1.8 Life-saving appliances include life-saving appliances and motor vehicle components which meet the descriptions of special provisions 235 or 296 of Chapter 3.3.

Environmentally hazardous substances

- 2.2.9.1.9 *(Deleted)*

Pollutants to the aquatic environment

2.2.9.1.10

- 2.2.9.1.10.1 For carriage in packages or in bulk, substances, solutions and mixtures meeting the criteria for Acute 1, Chronic 1 or Chronic 2 in Chapter 2.4 (see also 2.1.3.8) shall be considered to be environmentally hazardous (aquatic environment). Substances which cannot be assigned to other classes in ADN or to other Class 9 entries and which meet these criteria shall be assigned to UN Nos. 3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., or 3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S, and to packing group III.
- 2.2.9.1.10.2 For carriage in tank vessels, the substances, solutions and mixtures referred to in 2.2.9.1.10.1 and those meeting the criteria for Acute 2, Acute 3 or Chronic 3 in Chapter 2.4 shall be considered to be environmentally hazardous.

Substances classified as environmentally hazardous which meet the criteria for Acute or Chronic Category 1 shall be assigned to group ‘N1’.

Substances classified as environmentally hazardous which meet the criteria for Chronic Categories 2 or 3 shall be assigned to group ‘N2’.

Substances classified as environmentally hazardous which meet the criteria for Acute Categories 2 or 3 shall be assigned to group ‘N3’.

Substances which meet the criteria of 2.2.9.1.10 shall be assigned to UN Nos. 3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S, or 3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., MOLTEN. Those that meet the additional criteria in this paragraph shall be assigned to identification Nos. 9005, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S, MOLTEN, or 9006, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

2.2.9.1.10.3 Notwithstanding the provisions of 2.2.9.1.10.1,

- (a) Substances which cannot be assigned to entries other than UN Nos. 3077 and 3082 in Class 9 or to other entries in Classes 1 to 8, but which are identified in Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances,⁹ as amended, as substances to which letter N 'Environmentally hazardous' (R50; R50/53; R51/53) has been allocated; and
- (b) Solutions and mixtures (such as preparations and wastes) of substances to which letter N 'Environmentally hazardous' (R50; R50/53; R51/53) has been allocated in Directive 67/548/EEC, as amended, and which, according to Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations,¹⁰ as amended, are also allocated letter N 'Environmentally hazardous' (R50; R50/53; R51/53) and which cannot be assigned to entries other than UN Nos. 3077 and 3082 in Class 9 or to other entries in Classes 1 to 8;

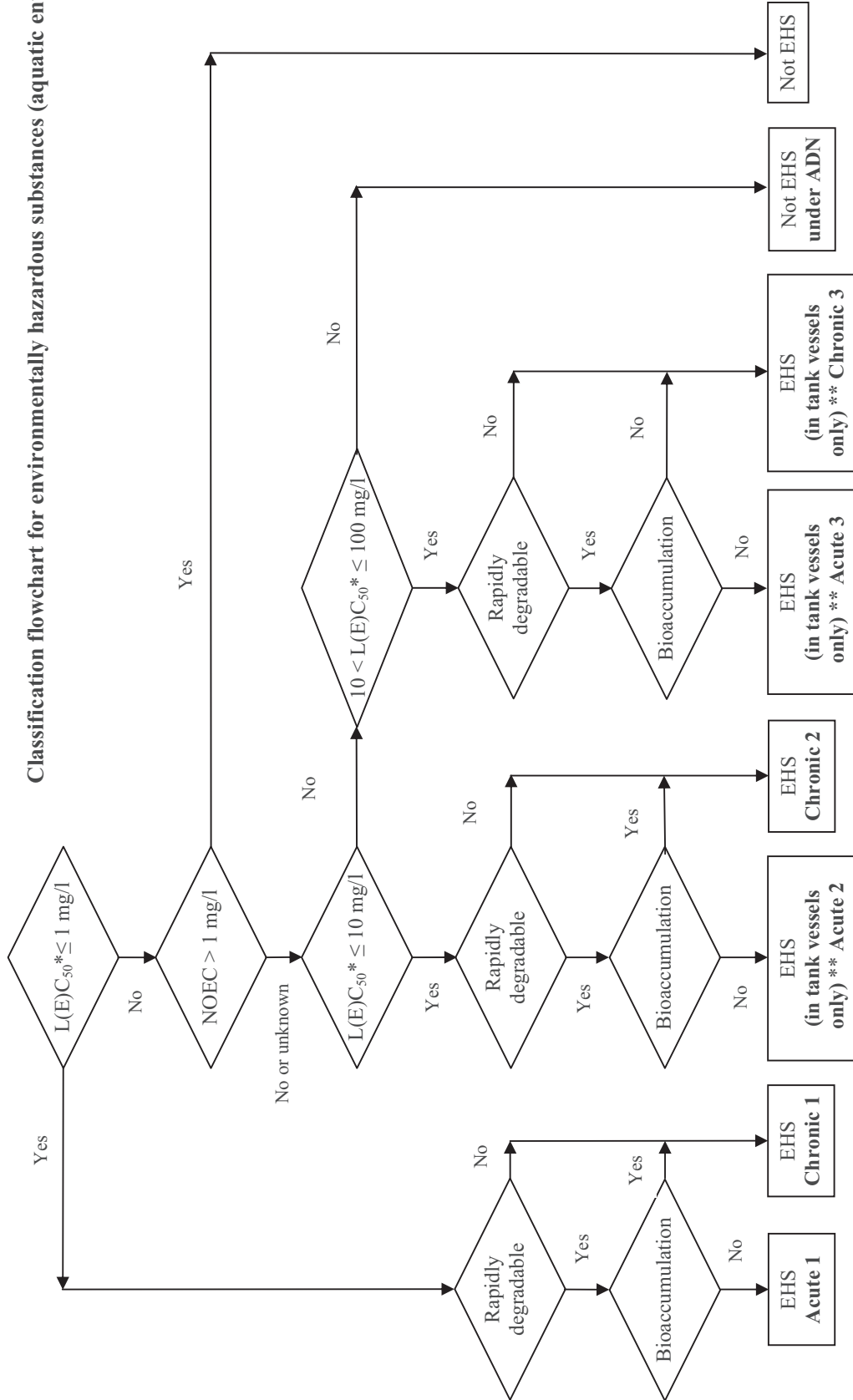
Shall be assigned to UN Nos. 3077 and 3082, as appropriate.

2.2.9.1.10.4 Classification flowchart for environmentally hazardous substances

⁹ *Official Journal of the European Communities No. 196, of 16 August 1967, pp. 1-5.*

¹⁰ *Official Journal of the European Communities No. L 200, of 30 July 1999, pp. 1-68.*

Classification flowchart for environmentally hazardous substances (aquatic environment)



EHS = Environmentally hazardous substance (aquatic environment).

* Lowest value of 96-hour LC₅₀, 48-hour EC₅₀ or 72- or 92-hour ErC₅₀ as appropriate.

** Substances not considered dangerous for the environment when transported in packages.

Genetically modified micro-organisms or organisms

- 2.2.9.1.11 Genetically modified micro-organisms (GMMOs) and genetically modified organisms (GMOs) are micro-organisms and organisms in which genetic material has been purposely altered through genetic engineering in a way that does not occur naturally. They are assigned to Class 9 (UN No. 3245) if they do not meet the definition of infectious substances, but are capable of altering animals, plants or microbiological substances in a way not normally the result of natural reproduction.

NOTE 1: GMMOs and GMOs which are infectious are substances of Class 6.2, UN Nos. 2814, 2900 or 3373).

NOTE 2: GMMOs or GMOs are not subject to the provisions of ADN when authorized for use by the competent authorities of the countries of origin, transit and destination¹¹.

NOTE 3: Live animals shall not be used to carry genetically modified micro-organisms classified in Class 9 unless the substance can be carried no other way.

- 2.2.9.1.12 (Deleted)

Elevated temperature substances

- 2.2.9.1.13 Elevated temperature substances include substances which are carried or handed over for carriage in the liquid state at or above 100 °C and, in the case of those with a flash-point, below their flash-point. They also include solids which are carried or handed over for carriage at or above 240 °C.

NOTE 1: Elevated temperature substances may be assigned to Class 9 only if they do not meet the criteria of any other class.

NOTE 2: Substances having a flash-point above 60 °C which are carried or handed over for carriage within a range of 15 K below the flash-point are substances of Class 3, identification number 9001.

Other substances presenting a danger during carriage but not meeting the definitions of another class.

- 2.2.9.1.14 The following other miscellaneous substances not meeting the definitions of another class are assigned to Class 9:

Solid ammonia compounds having a flash-point below 60 °C
Low hazard dithionites
Highly volatile liquids
Substances emitting noxious fumes
Substances containing allergens
Chemical kits and first aid kits

The following miscellaneous substances not meeting the definition of another class are assigned to Class 9 when they are carried in bulk or in tank vessels:

¹¹ See in particular Part C of Directive 2001/18/EC of the European Parliament and of the Council on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC (Official Journal of the European Communities, No. L 106, of 17 April 2001, pp. 8-14), which sets out the authorization procedures for the European Community.

- UN 2071 AMMONIUM NITRATE FERTILIZERS: uniform non-segregating mixtures of nitrogen phosphate or nitrogen potash types or complete fertilizers of nitrogen phosphate potash type, with not more than 70% ammonium nitrate and not more than 0.4% total combustible material, or with not more than 45% ammonium nitrate irrespective of their content of combustible material;

NOTE 1: *In determining the ammonium nitrate content, all nitrate ions for which a molecular equivalent of ammonium ions is present in the mixture shall be calculated as ammonium nitrate mass.*

NOTE 2: *Ammonium nitrate fertilizers of Class 9 are not subject to ADN if:*

- *the results of the trough test (see Manual of Tests and Criteria, Part III, sub-section 38.2) show that they are not capable of undergoing self-sustaining decomposition; and*
- *the calculation referred to in NOTE 1 does not give an excess of nitrate greater than 10% by mass, calculated in KNO_3 .*
- UN 2216 FISH MEAL, STABILIZED (humidity between 5% by mass and 12% by mass with not more than 15% fat by mass); or
- UN 2216 FISH SCRAP, STABILIZED (humidity between 5% by mass and 12% by mass with not more than 15% fat by mass);
- Identification No. 9003 SUBSTANCES HAVING A FLASH-POINT ABOVE 60° C AND NOT MORE THAN 100° C which cannot be assigned to another class or another entry of Class 9;
- Identification No. 9004, 4,4'-DIPHENYLMETHANE DIISOCYANATE.;
- Identification No. 9005, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S, MOLTEN, which cannot be assigned to UN No. 3077;
- Identification No. 9006, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., which cannot be assigned to UN No. 3082.

NOTE: *UN No. 1845 carbon dioxide, solid (dry ice), UN No. 2807 magnetized material, UN No. 3166 engine, internal combustion or vehicle, flammable gas powered or vehicle, flammable liquid powered, UN No. 3171 battery-powered vehicle or 3171 battery-powered equipment (wet battery), UN No. 3334 aviation regulated liquid, n.o.s., UN No. 3335 aviation regulated solid, n.o.s. and UN No. 3363 dangerous goods in machinery or dangerous goods in apparatus, listed in the UN Model Regulations, are not subject to the provisions of ADN.*

Assignment of the packing groups

2.2.9.1.15 When indicated in column 4 of Table A of Chapter 3.2, substances and articles of Class 9 are assigned to one of the following packing groups according to their degree of danger:

Packing group II: substances presenting medium danger;
 Packing group III: substances presenting low danger.

2.2.9.2 Substances and articles not accepted for carriage

The following substances and articles shall not be accepted for carriage:

- Lithium batteries which do not meet the relevant conditions of special provisions 188, 230 or 636 of Chapter 3.3;
- Uncleaned empty containment vessels for apparatus such as transformers, condensers and hydraulic apparatus containing substances assigned to UN Nos. 2315, 3151, 3152 or 3432.

2.2.9.3 List of collective entries

Substances which, on inhalation as fine dust, may endanger health	M1	2212 BLUE ASBESTOS (crocidolite) or 2212 BROWN ASBESTOS (amosite, mysorite) 2590 WHITE ASBESTOS (chrysotile, actinolite, anthophyllite, tremolite)
Substances and apparatus which, in the event of fire, may form dioxins	M2	2315 POLYCHLORINATED BIPHENYLS, LIQUID 3432 POLYCHLORINATED BIPHENYLS, SOLID 3151 POLYHALOGENATED BIPHENYLS, LIQUID or 3151 POLYHALOGENATED TERPHENYLS, LIQUID 3152 POLYHALOGENATED BIPHENYLS, SOLID or 3152 POLYHALOGENATED TERPHENYLS, SOLID
Substances evolving flammable vapour	M3	2211 POLYMERIC BEADS, EXPANDABLE, evolving flammable vapour 3314 PLASTICS MOULDING COMPOUND in dough, sheet or extruded rope form evolving flammable vapour
Lithium batteries	M4	3090 LITHIUM BATTERIES (including lithium alloy batteries) 3091 LITHIUM BATTERIES CONTAINED IN EQUIPMENT (including lithium alloy batteries) or 3091 LITHIUM BATTERIES PACKED WITH EQUIPMENT (including lithium alloy batteries) 3480 LITHIUM ION BATTERIES (including lithium ion polymer batteries) 3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT (including lithium ion polymer batteries) or 3481 LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)
Live-saving appliances	M5	2990 LIFE-SAVING APPLIANCES, SELF-INFLATING 3072 LIFE-SAVING APPLIANCES NOT SELF-INFLATING containing dangerous goods as equipment 3268 AIR BAG INFLATORS or 3268 AIR BAG MODULES or 3268 SEAT-BELT PRETENSIONERS
Environmentally hazardous substances	M6	pollutant to the aquatic environment, liquid 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
	M7	pollutant to the aquatic environment, solid 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
Elevated temperature substances	M8	genetically modified micro-organisms and organisms 3245 GENETICALLY MODIFIED MICROORGANISMS or 3245 GENETICALLY MODIFIED ORGANISMS
	M9	liquid 3257 ELEVATED TEMPERATURE LIQUID, N.O.S., at or above 100 °C and below its flash-point (including molten metal, molten salts, etc.)
	M10	solid 3258 ELEVATED TEMPERATURE SOLID, N.O.S., at or above 240 °C

(cont'd on next page)

2.2.9.3 *List of collective entries (cont'd)*

Other substances or articles presenting a danger during carriage, but not meeting the definitions of another class

M11

No collective entry available. Only substances listed in Table A of Chapter 3.2 are subject to the provisions for Class 9 under this classification code, as follows:
1841 ACETALDEHYDE AMMONIA
1931 ZINC DITHIONITE (ZINC HYDROSULPHITE)
1941 DIBROMODIFLUOROMETHANE
1990 BENZALDEHYDE
2969 CASTOR BEANS, or
2969 CASTOR MEAL, or
2969 CASTOR POMACE, or
2969 CASTOR FLAKE
3316 CHEMICAL KIT, or
3316 FIRST AID KIT
3359 FUMIGATED UNIT

CHAPTER 2.3**TEST METHODS****2.3.0 General**

Unless otherwise provided for in Chapter 2.2 or in this Chapter, the test methods to be used for the classification of dangerous goods are those described in the Manual of Tests and Criteria.

2.3.1 Exudation test for blasting explosives of Type A

2.3.1.1 Blasting explosives of type A (UN No. 0081) shall, if they contain more than 40 % liquid nitric ester, in addition to the testing specified in the Manual of Tests and Criteria, satisfy the following exudation test.

2.3.1.2 The apparatus for testing blasting explosive for exudation (figs. 1 to 3) consists of a hollow bronze cylinder. This cylinder, which is closed at one end by a plate of the same metal, has an internal diameter of 15.7 mm and a depth of 40 mm.

It is pierced by 20 holes 0.5 mm in diameter (four sets of five holes) on the circumference. A bronze piston, cylindrically fashioned over a length of 48 mm and having a total length of 52 mm, slides into the vertically placed cylinder.

The piston, whose diameter is 15.6 mm, is loaded with a mass of 2 220 g so that a pressure of 120 kPa (1.20 bar) is exerted on the base of the cylinder.

2.3.1.3 A small plug of blasting explosive weighing 5 to 8 g, 30 mm long and 15 mm in diameter, is wrapped in very fine gauze and placed in the cylinder; the piston and its loading mass are then placed on it so that the blasting explosive is subjected to a pressure of 120 kPa (1.20 bar). The time taken for the appearance of the first signs of oily droplets (nitroglycerine) at the outer orifices of the cylinder holes is noted.

2.3.1.4 The blasting explosive is considered satisfactory if the time elapsing before the appearance of the liquid exudations is more than five minutes, the test having been carried out at a temperature of 15 °C to 25 °C.

Test of blasting explosive for exudation

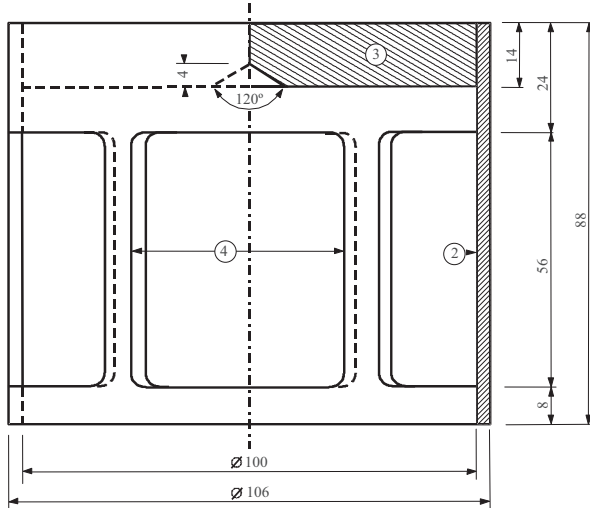


Fig.1: Bell-form charge, mass 2220 g, capable of being suspended from a bronze piston

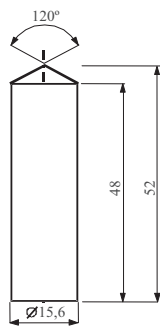


Fig.2: Cylindrical bronze piston, dimensions in mm

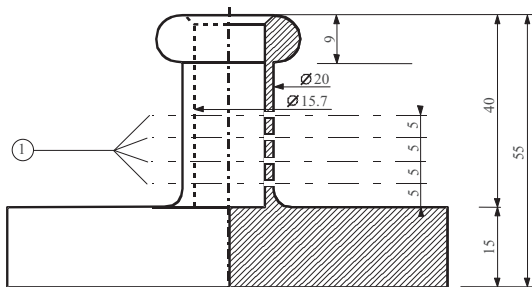


Fig.3: Hollow bronze cylinder, closed at one end; Plan and cut dimensions in mm

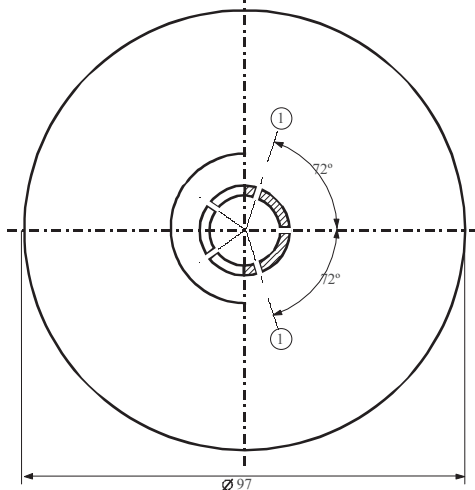


Fig. 1 to 3

- (1) 4 series of 5 holes at 0.5 Ø
- (2) copper
- (3) iron plate with centre cone at the inferior face
- (4) 4 openings, approximately 46x56, set at even intervals on the periphery

2.3.2 Tests relating to nitrated cellulose mixtures of Class 4.1

- 2.3.2.1 Nitrocellulose heated for half an hour at 132 °C shall not give off visible yellowish-brown nitrous fumes (nitrous gases). The ignition temperature shall be above 180 °C. See 2.3.2.3 to 2.3.2.8, 2.3.2.9 (a) and 2.3.2.10 below.
- 2.3.2.2 3 g of plasticized nitrocellulose, heated for one hour at 132 °C, shall not give off visible yellowish-brown nitrous fumes (nitrous gases). The ignition temperature shall be above 170 °C. See 2.3.2.3 to 2.3.2.8, 2.3.2.9 (b) and 2.3.2.10 below.
- 2.3.2.3 The test procedures set out below are to be applied when differences of opinion arise as to the acceptability of substances for carriage by road.
- 2.3.2.4 If other methods or test procedures are used to verify the conditions of stability prescribed above in this section, those methods shall lead to the same findings as could be reached by the methods specified below.
- 2.3.2.5 In carrying out the stability tests by heating described below, the temperature of the oven containing the sample under test shall not deviate by more than 2 °C from the prescribed temperature; the prescribed duration of a 30-minute or 60-minute test shall be observed to within two minutes. The oven shall be such that the required temperature is restored not more than five minutes after insertion of the sample.
- 2.3.2.6 Before undergoing the tests in 2.3.2.9 and 2.3.2.10, the samples shall be dried for not less than 15 hours at the ambient temperature in a vacuum desiccator containing fused and granulated calcium chloride, the sample substance being spread in a thin layer; for this purpose, substances which are neither in powder form nor fibrous shall be ground, or grated, or cut into small pieces. The pressure in the desiccator shall be brought below 6.5 kPa (0.065 bar).
- 2.3.2.7 Before being dried as prescribed in 2.3.2.6 above, substances conforming to 2.3.2.2 shall undergo preliminary drying in a well-ventilated oven, with its temperature set at 70 °C, until the loss of mass per quarter-hour is less than 0.3 % of the original mass.
- 2.3.2.8 Weakly nitrated nitrocellulose conforming to 2.3.2.1 shall first undergo preliminary drying as prescribed in 2.3.2.7 above; drying shall then be completed by keeping the nitrocellulose for at least 15 hours over concentrated sulphuric acid in a desiccator.

2.3.2.9 Test of chemical stability under heat

(a) *Test of the substance listed in paragraph 2.3.2.1 above.*

(i) In each of two glass test tubes having the following dimensions:

length	350	mm
internal diameter	16	mm
thickness of wall	1.5	mm

is placed 1 g of substance dried over calcium chloride (if necessary the drying shall be carried out after reducing the substance to pieces weighing not more than 0.05 g each).

Both test tubes, completely covered with loose-fitting closures, are then so placed in an oven that at least four-fifths of their length is visible, and are kept at a constant temperature of 132 °C for 30 minutes. It is observed whether nitrous gases in the form of yellowish-brown fumes clearly visible against a white background are given off during this time.

(ii) In the absence of such fumes the substance is deemed to be stable.

- (b) *Test of plasticized nitrocellulose (see 2.3.2.2)*
 - (i) 3 g of plasticized nitrocellulose are placed in glass test tubes, similar to those referred to in (a), which are then placed in an oven kept at a constant temperature of 132 °C.
 - (ii) The test tubes containing the plasticized nitrocellulose are kept in the oven for one hour. During this time no yellowish-brown nitrous fumes (nitrous gases) shall be visible. Observation and appraisal as in (a).

2.3.2.10 *Ignition temperature (see 2.3.2.1 and 2.3.2.2)*

- (a) The ignition temperature is determined by heating 0.2 g of substance enclosed in a glass test tube immersed in a Wood's alloy bath. The test tube is placed in the bath when the latter has reached 100 °C. The temperature of the bath is then progressively increased by 5 °C per minute;
- (b) The test tubes must have the following dimensions:

length	125 mm
internal diameter	15 mm
thickness of wall	0.5 mm

and shall be immersed to a depth of 20 mm;
- (c) The test shall be repeated three times, the temperature at which ignition of the substance occurs, i.e., slow or rapid combustion, deflagration or detonation, being noted each time;
- (d) The lowest temperature recorded in the three tests is the ignition temperature.

2.3.3 **Tests relating to flammable liquids of Classes 3, 6.1 and 8**

2.3.3.1 *Test for determining flash-point*

2.3.3.1.1 The flash-point shall be determined by means of one of the following types of apparatus:

- (a) Abel;
- (b) Abel-Pensky;
- (c) Tag;
- (d) Pensky-Martens;
- (e) Apparatus in accordance with ISO 3679:1983 or ISO 3680:1983.

2.3.3.1.2 To determine the flash-point of paints, gums and similar viscous products containing solvents, only apparatus and test methods suitable for determining the flash-point for viscous liquids shall be used, in accordance with the following standards:

- (a) International Standard ISO 3679:1983;
- (b) International Standard ISO 3680:1983;
- (c) International Standard ISO 1523:1983;
- (d) German Standard DIN 53213:1978, Part 1.

- 2.3.3.1.3 The test procedure shall be either according to an equilibrium method or according to a non-equilibrium method.
- 2.3.3.1.4 For the procedure according to an equilibrium method, see:
- (a) International Standard ISO 1516:1981;
 - (b) International Standard ISO 3680:1983;
 - (c) International Standard ISO 1523:1983;
 - (d) International Standard ISO 3679:1983.
- 2.3.3.1.5 The procedure according to a non-equilibrium method shall be:
- (a) for the Abel apparatus, see:
 - (i) British Standard BS 2000 Part 170:1995;
 - (ii) French Standard NF MO7-011:1988;
 - (iii) French Standard NF T66-009:1969;
 - (b) for the Abel-Pensky apparatus, see:
 - (i) German Standard DIN 51755, Part 1:1974 (for temperatures from 5 °C to 65 °C);
 - (ii) German Standard DIN 51755, Part 2:1978 (for temperatures below 5 °C);
 - (iii) French Standard NF MO7-036:1984;
 - (c) for the Tag apparatus, see American Standard ASTM D 56:1993;
 - (d) for the Pensky-Martens apparatus, see:
 - (i) International Standard ISO 2719:1988;
 - (ii) European Standard EN 22719 in each of its national versions (e.g. BS 2000, part 404/EN 22719):1994;
 - (iii) American Standard ASTM D 93:1994;
 - (iv) Institute of Petroleum Standard IP 34:1988.
- 2.3.3.1.6 The test methods listed in 2.3.3.1.4 and 2.3.3.1.5 shall only be used for flash-point ranges which are specified in the individual methods. The possibility of chemical reactions between the substance and the sample holder shall be considered when selecting the method to be used. The apparatus shall, as far as is consistent with safety, be placed in a draught-free position. For safety, a method utilizing a small sample size, around 2 ml, shall be used for organic peroxides and self-reactive substances (also known as "energetic" substances), or for toxic substances.
- 2.3.3.1.7 When the flash-point, determined by a non-equilibrium method in accordance with 2.3.3.1.5 is found to be 23 ± 2 °C or 60 ± 2 °C, it shall be confirmed for each temperature range by an equilibrium method in accordance with 2.3.3.1.4.

- 2.3.3.1.8 In the event of a dispute as to the classification of a flammable liquid, the classification proposed by the consignor shall be accepted if a check-test of the flash-point, yields a result not differing by more than 2 °C from the limits (23 °C and 60 °C respectively) stated in 2.2.3.1. If the difference is more than 2 °C, a second check-test shall be carried out, and the lowest figure of the flash-points obtained in either check-test shall be adopted.

2.3.3.2 *Test for determining peroxide content*

To determine the peroxide content of a liquid, the procedure is as follows:

A quantity p (about 5 g, weighed to the nearest 0.01 g) of the liquid to be titrated is placed in an Erlenmeyer flask; 20 cm³ of acetic anhydride and about 1 g of powdered solid potassium iodide are added; the flask is shaken and, after 10 minutes, heated for 3 minutes to about 60 °C. When it has been left to cool for 5 minutes, 25 cm³ of water are added. After this, it is left standing for half an hour, then the liberated iodine is titrated with a decinormal solution of sodium thiosulphate, no indicator being added; complete discoloration indicates the end of the reaction. If n is the number of cm³ of thiosulphate solution required, the percentage of peroxide (calculated as H₂O₂) present in the sample is obtained by the formula:

$$\frac{17n}{100p}$$

2.3.4 Test for determining fluidity

To determine the fluidity of liquid, viscous or pasty substances and mixtures, the following test method shall be used.

2.3.4.1 Test apparatus

Commercial penetrometer conforming to ISO 2137:1985, with a guide rod of $47.5 \text{ g} \pm 0.05 \text{ g}$; sieve disc of duralumin with conical bores and a mass of $102.5 \text{ g} \pm 0.05 \text{ g}$ (see Figure 1); penetration vessel with an inside diameter of 72 mm to 80 mm for reception of the sample.

2.3.4.2 Test procedure

The sample is poured into the penetration vessel not less than half an hour before the measurement. The vessel is then hermetically closed and left standing until the measurement. The sample in the hermetically closed penetration vessel is heated to $35 \text{ }^\circ\text{C} \pm 0.5 \text{ }^\circ\text{C}$ and is placed on the penetrometer table immediately prior to measurement (not more than two minutes). The point S of the sieve disc is then brought into contact with the surface of the liquid and the rate of penetration is measured.

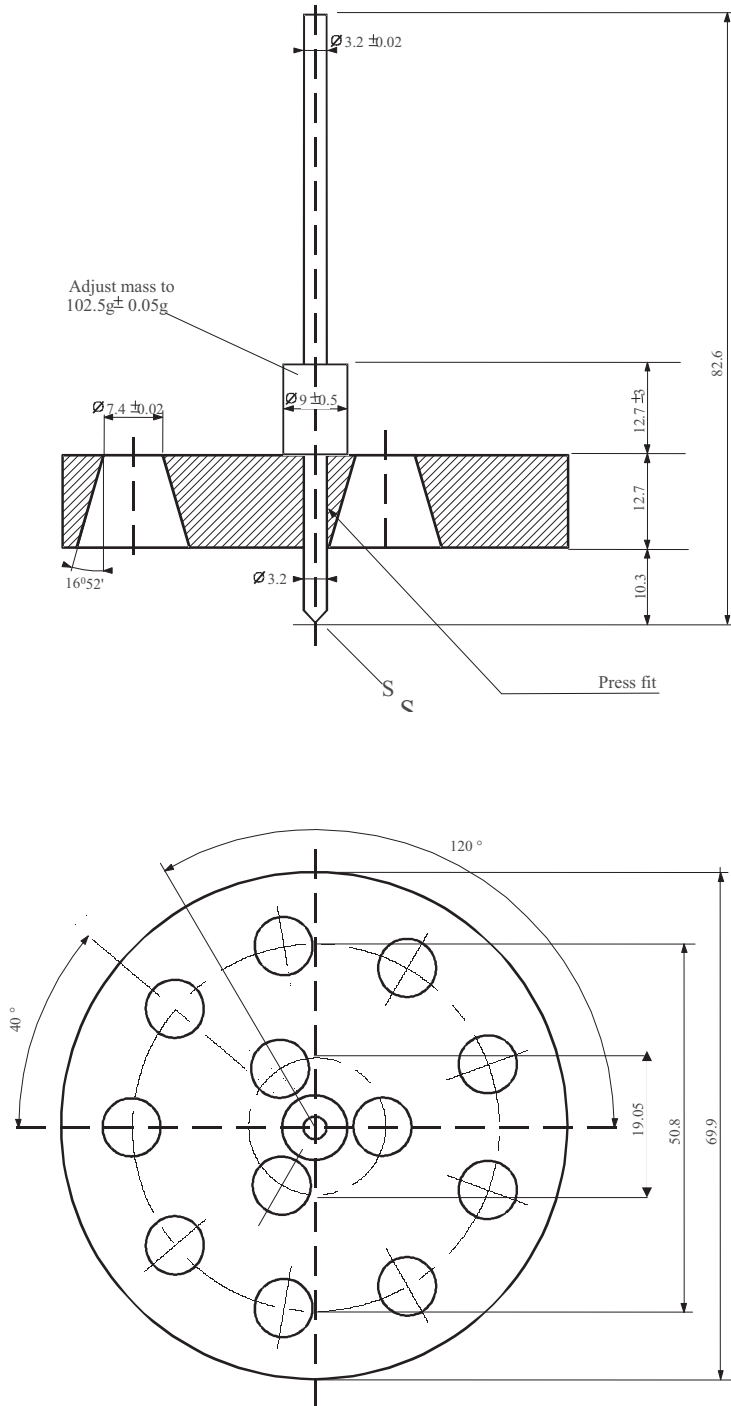
2.3.4.3 Evaluation of test results

A substance is pasty if, after the centre S has been brought into contact with the surface of the sample, the penetration indicated by the dial gauge:

- (a) after a loading time of $5 \text{ s} \pm 0.1 \text{ s}$, is less than $15.0 \text{ mm} \pm 0.3 \text{ mm}$; or
- (b) after a loading time of $5 \text{ s} \pm 0.1 \text{ s}$, is greater than $15.0 \text{ mm} \pm 0.3 \text{ mm}$, but the additional penetration after another $55 \text{ s} \pm 0.5 \text{ s}$ is less than $5.0 \text{ mm} \pm 0.5 \text{ mm}$.

NOTE: In the case of samples having a flow point, it is often impossible to produce a steady level surface in the penetration vessel and, hence, to establish satisfactory initial measuring conditions for the contact of the point S. Furthermore, with some samples, the impact of the sieve disc can cause an elastic deformation of the surface and, in the first few seconds, simulate a deeper penetration. In all these cases, it may be appropriate to make the evaluation in paragraph (b) above.

Figure 1 – Penetrometer



Tolerances not specified are ± 0.1 mm.

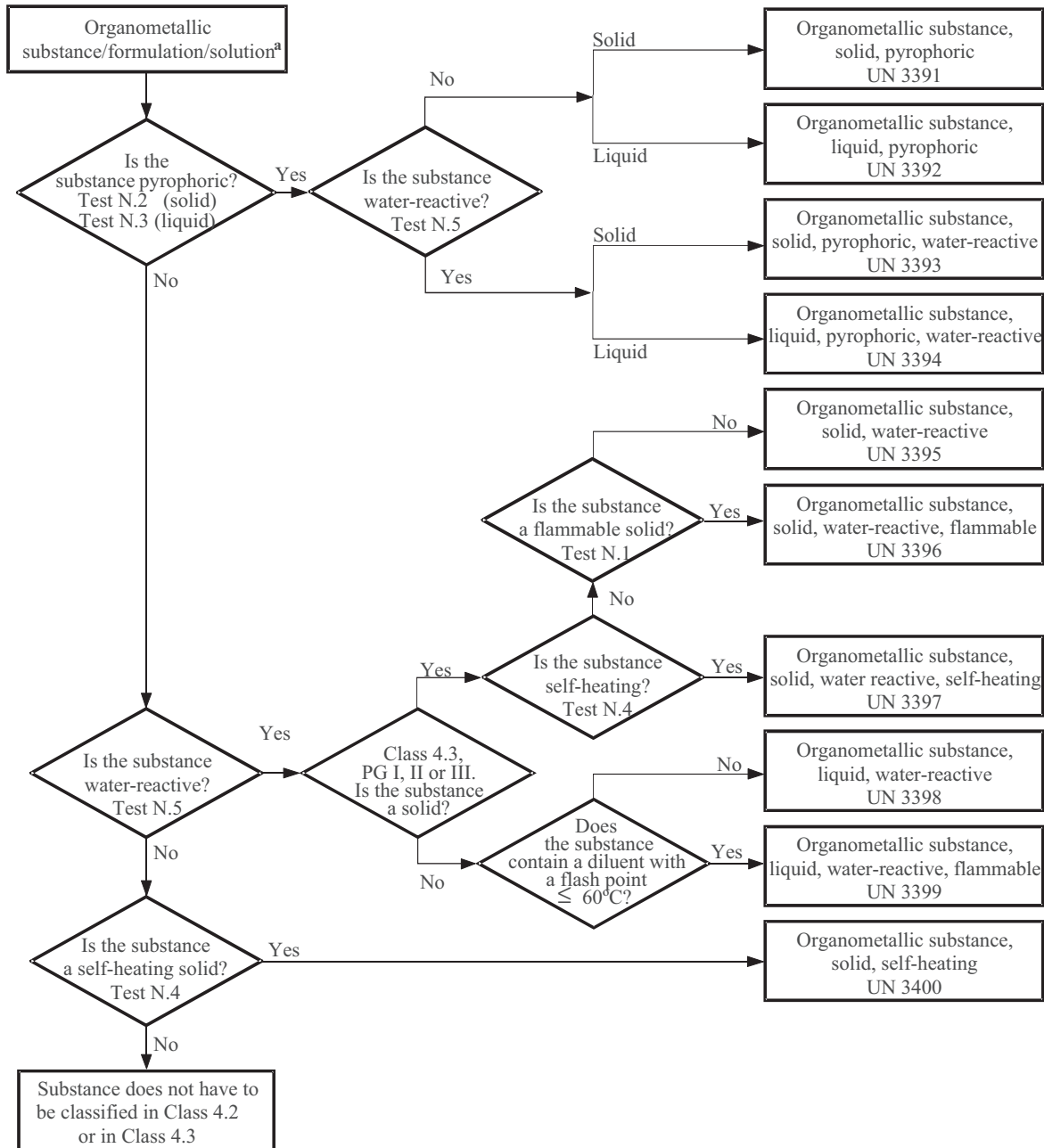
2.3.5 Classification of organometallic substances in Classes 4.2 and 4.3

Depending on their properties as determined in accordance with tests N.1 to N.5 of the Manual of Tests and Criteria, Part III, section 33, organometallic substances may be classified in Classes 4.2 or 4.3, as appropriate, in accordance with the flowchart scheme given in Figure 2.3.5.

NOTE 1: *Depending on their other properties and on the precedence of hazard table (see 2.1.3.10), organometallic substances may have to be classified in other classes as appropriate.*

NOTE 2: *Flammable solutions with organometallic compounds in concentrations which are not liable to spontaneous combustion or, in contact with water, do not emit flammable gases in dangerous quantities, are substances of Class 3.*

Figure 2.3.5 Flowchart scheme for the classification of organometallic substances in Classes 4.2 and 4.3^b



^a If applicable and testing is relevant, taking into account reactivity properties, class 6.1 and 8 properties should be considered according to the precedence of hazard table of 2.1.3.10.

^b Test methods N.1 to N.5 can be found in the Manual of Tests and Criteria, Part III, Section 33.

CHAPTER 2.4

CRITERIA FOR SUBSTANCES HAZARDOUS TO THE AQUATIC ENVIRONMENT

2.4.1 General definitions

2.4.1.1 Environmentally hazardous substances include, inter alia, liquid or solid substances pollutant to the aquatic environment and solutions and mixtures of such substances (such as preparations and wastes). For the purposes of this Chapter, 'substance' means chemical elements and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurities deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.

2.4.1.2 The aquatic environment may be considered in terms of the aquatic organisms that live in the water, and the aquatic ecosystem of which they are part.¹ The basis, therefore, of the identification of hazard is the aquatic toxicity of the substance or mixture, although this may be modified by further information on the degradation and bioaccumulation behaviour.

2.4.1.3 While the following classification procedure is intended to apply to all substances and mixtures, it is recognized that in some cases, e.g. metals or poorly soluble inorganic compounds, special guidance will be necessary.²

2.4.1.4 The following definitions apply for acronyms or terms used in this section:

- BCF: Bioconcentration Factor;
- BOD: Biochemical Oxygen Demand;
- COD: Chemical Oxygen Demand;
- GLP: Good Laboratory Practices;
- EC₅₀: the effective concentration of substance that causes 50% of the maximum response;
- ErC₅₀: EC₅₀ in terms of reduction of growth;
- K_{ow}: octanol/water partition coefficient;
- LC₅₀ (50% lethal concentration): the concentration of a substance in water which causes the death of 50% (one half) in a group of test animals;
- L(E)C₅₀: LC₅₀ or EC₅₀;
- NOEC: No Observed Effect Concentration;
- OECD Test Guidelines: test guidelines published by the Organisation for Economic Co-operation and Development (OECD).

¹ This does not address aquatic pollutants for which there may be a need to consider effects beyond the aquatic environment such as the impacts on human health, etc

² See annex 10 of GHS.

2.4.2 Definitions and data requirements

2.4.2.1 The basic elements for classification of environmentally hazardous substances (aquatic environment) are as follows:

- Acute aquatic toxicity;
- Potential for or actual bioaccumulation;
- Degradation (biotic or abiotic) for organic chemicals; and
- Chronic aquatic toxicity.

2.4.2.2 While data from internationally harmonized test methods are preferred, in practice, data from national methods may also be used where they are considered as equivalent. In general, it has been agreed that freshwater and marine species toxicity data can be considered as equivalent data and are preferably to be derived using OECD Test Guidelines or equivalent according to the principles of Good Laboratory Practices (GLP). Where such data are not available, classification should be based on the best available data.

2.4.2.3 **Acute aquatic toxicity** shall normally be determined using a fish 96-hour LC₅₀ (OECD Test Guideline 203 or equivalent), a crustacea species 48-hour EC₅₀ (OECD Test Guideline 202 or equivalent) and/or an algal species 72- or 96-hour EC₅₀ (OECD Test Guideline 201 or equivalent). These species are considered as surrogate for all aquatic organisms, and data on other species such as Lemna may also be considered if the test methodology is suitable.

2.4.2.4 **Bioaccumulation** means net result of uptake, transformation and elimination of a substance in an organism due to all routes of exposure (i.e. air, water, sediment/soil and food).

The **potential for bioaccumulation** shall normally be determined by using the octanol/water partition coefficient, usually reported as a log K_{ow} determined by OECD Test Guideline 107 or 117. While this represents a potential to bioaccumulate, an experimentally determined Bioconcentration Factor (BCF) provides a better measure and should be used in preference when available. A BCF should be determined according to OECD Test Guideline 305.

2.4.2.5 **Environmental degradation** may be biotic or abiotic (e.g. hydrolysis) and the criteria reflect this fact. Ready biodegradation can most easily be defined using the OECD biodegradability tests, OECD Test Guideline 301 (A - F). A pass level in these tests can be considered as indicative of rapid degradation in most environments. These are freshwater tests and thus the use of the results from OECD Test Guideline 306, which is more suitable for marine environments, has also been included. Where such data are not available, a BOD₅ (5 days)/COD ratio ≥ 0.5 is considered as indicative of rapid degradation. Abiotic degradation such as hydrolysis, primary degradation, both abiotic and biotic, degradation in non-aquatic media and proven rapid degradation in the environment may all be considered in defining rapid degradability.³

Substances shall be considered rapidly degradable in the environment if the following criteria are met:

- (a) In 28-day ready biodegradation studies, the following levels of degradation are achieved:
 - (i) Tests based on dissolved organic carbon: 70%;

³ Special guidance on data interpretation is provided in Chapter 4.1 and Annex 9 to GHS.

- (ii) Tests based on oxygen depletion or carbon dioxide generation: 60% of theoretical maxima;

These levels of biodegradation shall be achieved within 10 days of the start of degradation, which point is taken as the time when 10% of the substance has been degraded; or

- (b) In those cases where only BOD and COD data are available, when the ratio of BOD₅/COD is ≥ 0.5 ; or
- (c) If other convincing scientific evidence is available to demonstrate that the substance or mixture can be degraded (biotically and/or abiotically) in the aquatic environment to a level above 70% within a 28-day period.

2.4.2.6 **Chronic toxicity** data are less available than acute data and the range of testing procedures less standardized. Data generated according to OECD Test Guidelines 210 (Fish Early Life Stage) or 211 (Daphnia Reproduction) and 201 (Algal Growth Inhibition) can be accepted. Other validated and internationally accepted tests could also be used. The No Observed Effect Concentrations (NOECs) or other equivalent L(E)Cx should be used.

2.4.3 Classification categories and criteria for substances

NOTE: Chronic Category 4 of Chapter 4.1 of GHS is reproduced in this section for information, although it is not relevant in the context of ADN.

2.4.3.1 The following substances shall be considered to be environmentally hazardous (aquatic environment):

- (a) For carriage in packages, substances which meet the criteria for Acute 1, Chronic 1 or Chronic 2, according to the tables below; and
- (b) For carriage in tank vessels, substances which meet the criteria for Acute 1, Acute 2 or Acute 3, or Chronic 1, Chronic 2 or Chronic 3, according to the tables below.

Acute toxicity

Category: Acute 1

96 hr LC ₅₀ (for fish)	≤ 1 mg/l and/or
48 hr EC ₅₀ (for crustacea)	≤ 1 mg/l and/or
72 or 96 hr ErC ₅₀ (for algae or other aquatic plants)	≤ 1 mg/l

Category: Acute 2

96 hr LC ₅₀ (for fish)	$>1 - \leq 10$ mg/l and/or
48 hr EC ₅₀ (for crustacea)	$>1 - \leq 10$ mg/l and/or
72 or 96 hr ErC ₅₀ (for algae or other aquatic plants)	$>1 - \leq 10$ mg/l

Category: Acute 3

96 hr LC ₅₀ (for fish)	$>10 - \leq 100$ mg/l and/or
48 hr EC ₅₀ (for crustacea)	$>10 - \leq 100$ mg/l and/or
72 or 96 hr ErC ₅₀ (for algae or other aquatic plants)	$>10 - \leq 100$ mg/l

Chronic toxicity**Category: Chronic 1**

96 hr LC ₅₀ (for fish)	≤ 1 mg/l and/or
48 hr EC ₅₀ (for crustacea)	≤ 1 mg/l and/or
72 or 96 hr ErC ₅₀ (for algae or other aquatic plants)	≤ 1 mg/l
and the substance is not rapidly degradable and/or the log K _{ow} ≥ 4 (unless the experimentally determined BCF <500).	

Category: Chronic 2

96 hr LC ₅₀ (for fish)	> 1 to ≤ 10 mg/l and/or
48 hr EC ₅₀ (for crustacea)	> 1 to ≤ 10 mg/l and/or
72 or 96 hr ErC ₅₀ (for algae or other aquatic plants)	> 1 to ≤ 10 mg/l
and the substance is not rapidly degradable and/or the log K _{ow} ≥ 4 (unless the experimentally determined BCF <500), unless the chronic toxicity NOECs are > 1 mg/l.	

Category: Chronic 3

96 hr LC ₅₀ (for fish)	> 10 to ≤ 100 mg/l and/or
48 hr EC ₅₀ (for crustacea)	> 10 to ≤ 100 mg/l and/or
72 or 96 hr ErC ₅₀ (for algae or other aquatic plants)	≥ 10 to ≤ 100 mg/l
and the substance is not rapidly degradable and/or the log K _{ow} ≥ 4 (unless the experimentally determined BCF <500), unless the chronic toxicity NOECs are > 1 mg/l.	

Category: Chronic 4

Poorly soluble substances for which no acute toxicity is recorded at levels up to the water solubility, and which are not rapidly degradable and have a log K_{ow} ≥ 4, indicating a potential to bioaccumulate, will be classified in this category unless other scientific evidence exists showing classification to be unnecessary. Such evidence would include an experimentally determined BCF < 500, or chronic toxicity NOECs > 1 mg/l, or evidence of rapid degradation in the environment.

Substances which come under Chronic Category 4 alone are not considered to be environmentally hazardous in the sense of ADN.

2.4.4 Classification categories and criteria for mixtures

NOTA: Chronic Category 4 of Chapter 4.1 of GHS is reproduced in this section for information, although it is not relevant in the context of ADN.

2.4.4.1 The classification system for mixtures covers all classification categories which are used for substances, meaning Acute Categories 1 to 3 and Chronic Categories 1 to 4. In order to make use of all available data for purposes of classifying the aquatic environmental hazards of the mixture, the following assumption has been made and is applied where appropriate.

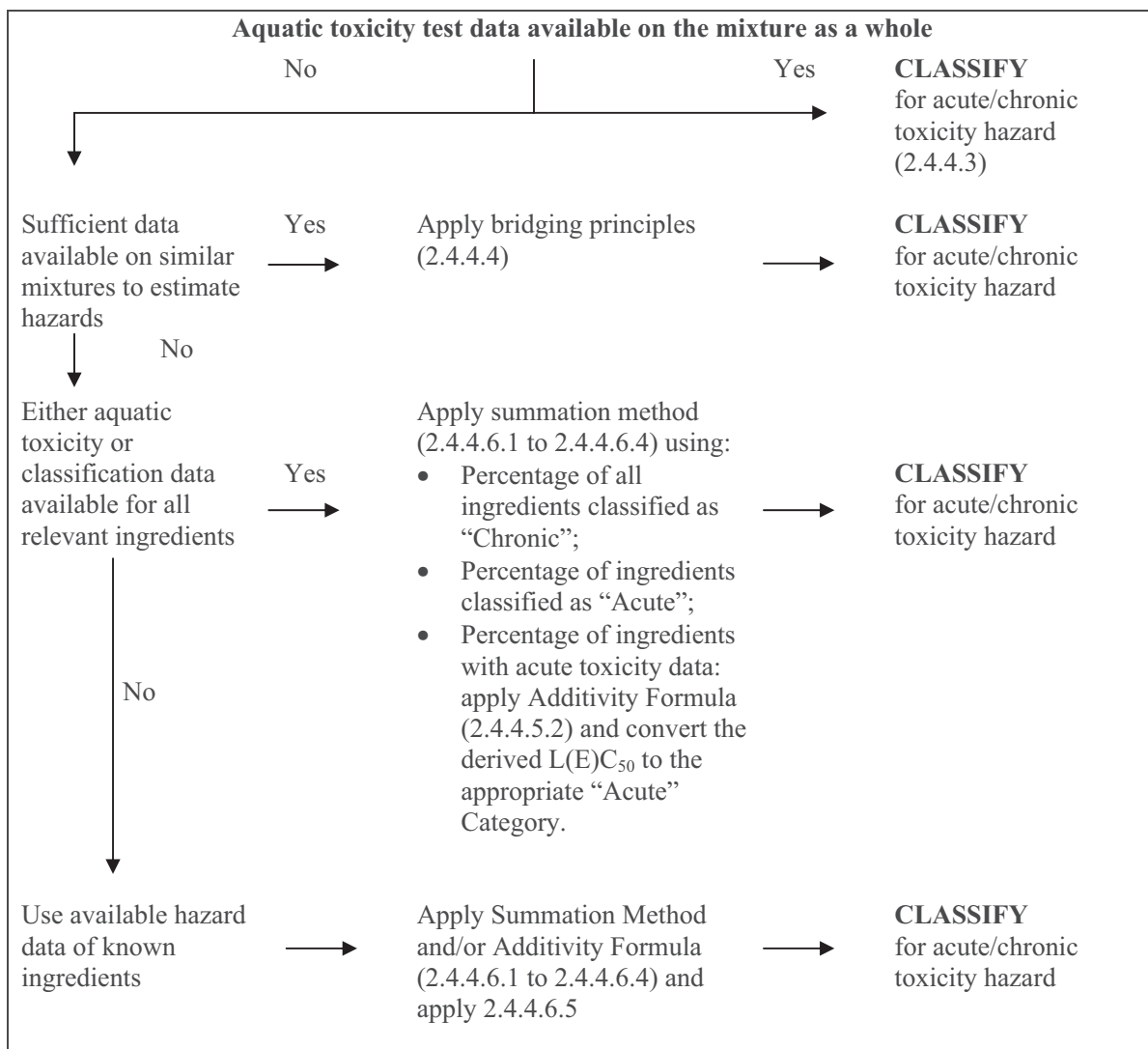
The 'relevant ingredients' of a mixture are those which are present in a concentration of 1% (mass) or greater, unless there is a presumption (e.g. in the case of highly toxic ingredients) that an ingredient present at less than 1% can still be relevant for classifying the mixture for aquatic environmental hazards.

2.4.4.2 The approach for classification of aquatic environmental hazards is tiered and is dependent upon the type of information available for the mixture itself and for its ingredients. Elements of the tiered approach include:

- (a) Classification based on tested mixtures;
 (b) Classification based on bridging principles,
 (c) Use of ‘summation of classified ingredients’ and/or an ‘additivity formula’.

Figure 2.4.4.2 outlines the process to be followed.

Figure 2.4.4.2: Tiered approach to classification of mixtures for acute and chronic environmental hazards



2.4.4.3 *Classification of mixtures when data are available for the complete mixture*

- 2.4.4.3.1 When the mixture as a whole has been tested to determine its aquatic toxicity, it can be classified according to the criteria that have been agreed for substances, but only for acute toxicity. The classification shall be based on the data for fish, crustacea, algae and plants. Classification of mixtures by using LC₅₀, EC₅₀ or ErC₅₀ data for the mixture as a whole is not possible for chronic categories since both toxicity data and environmental fate data are needed, and there are no degradability and bioaccumulation data for mixtures as a whole. It is not possible to apply the criteria for chronic classification because the data from degradability

and bioaccumulation tests of mixtures cannot be interpreted; they are meaningful only for single substances.

2.4.4.3.2 When there are acute toxicity test data (LC₅₀ or EC₅₀) available for the mixture as a whole, these data as well as information with respect to the classification of ingredients for chronic toxicity shall be used to complete the classification for tested mixtures as follows. When chronic (long-term) toxicity data (NOEC) are also available, these should be used as well.

- (a) L(E)C₅₀ (LC₅₀ or EC₅₀) of the tested mixture \leq 100 mg/l and NOEC of the tested mixture \leq 1.0 mg/l or unknown:
 - (i) Classify mixture as Category Acute 1, 2 or 3;
 - (ii) Apply summation of classified ingredients approach (see 2.4.4.6) for chronic classification (Chronic 1 to 4 or no need for chronic classification);
- (b) L(E)C₅₀ of the tested mixture \leq 100 mg/l and NOEC of the tested mixture = 1.0 mg/l:
 - (i) Classify mixture as Category Acute 1, 2 or 3;
 - (ii) Apply summation of classified ingredients approach (see 2.4.4.6) for classification as Category Chronic 1. If the mixture is not classified as Category Chronic 1, then there is no need for chronic classification;
- (c) L(E)C₅₀ of the tested mixture = 100 mg/l, or above the water solubility, and NOEC of the tested mixture \leq 1.0 mg/l or unknown:
 - (i) No need to classify for acute toxicity hazard;
 - (ii) Apply summation of classified ingredients approach (see 2.4.4.6) for chronic classification (Chronic 4 or no need for chronic classification);
- (d) L(E)C₅₀ of the tested mixture >100 mg/l, or above the water solubility, and NOEC of the tested mixture > 1.0 mg/l:
 - No need to classify for acute or chronic toxicity hazard.

2.4.4.4 *Classification of mixtures when data are not available for the complete mixture: bridging principles*

2.4.4.4.1 Where the mixture itself has not been tested to determine its aquatic environmental hazard, but there are sufficient data on the individual ingredients and similar tested mixtures to adequately characterize the hazards of the mixture, these data shall be used in accordance with the following agreed bridging rules. This ensures that the classification process uses the available data to the greatest extent possible in characterizing the hazards of the mixture without the necessity for additional testing in animals.

2.4.4.4.2 *Dilution*

2.4.4.4.2.1 If a mixture is formed by diluting another classified mixture or a substance with a diluent which has an equivalent or lower aquatic hazard classification than the least toxic original ingredient and which is not expected to affect the aquatic hazards of other ingredients, then the mixture will be classified as equivalent to the original mixture or substance.

2.4.4.4.2.2 If a mixture is formed by diluting another classified mixture or a substance with water or other totally non-toxic material, the toxicity of the mixture shall be calculated from the original mixture or substance.

2.4.4.4.3 *Batching*

The aquatic hazard classification of one production batch of a complex mixture can be assumed to be substantially equivalent to that of another production batch of the same commercial product and produced by or under the control of the same manufacturer, unless there is reason to believe there is significant variation such that the aquatic hazard classification of the batch has changed. If the latter occurs, new classification is necessary.

2.4.4.4.4 *Concentration of mixtures which are classified with the most severe classification categories (Chronic 1 and Acute 1)*

If a mixture is classified as Chronic 1 and/or Acute 1, and ingredients of the mixture which are classified as Chronic 1 and/or Acute 1 are further concentrated, the more concentrated mixture shall be classified with the same classification category as the original mixture without additional testing.

2.4.4.4.5 *Interpolation within one toxicity category*

If mixtures A and B are in the same classification category and mixture C is made in which the toxicologically active ingredients have concentrations intermediate to those in mixtures A and B, then mixture C shall be in the same category as A and B. Note that the identity of the ingredients is the same in all three mixtures.

2.4.4.4.6 *Substantially similar mixtures*

Given the following:

(a) Two mixtures:

(i) A + B;

(ii) C + B;

(b) The concentration of ingredient B is the same in both mixtures;

(c) The concentration of ingredient A in mixture (i) equals that of ingredient C in mixture (ii);

(d) Classifications for A and C are available and are the same, i.e. they are in the same hazard category and are not expected to affect the aquatic toxicity of B.

Then there is no need to test mixture (ii) if mixture (i) is already characterized by testing and both mixtures are classified in the same category.

2.4.4.5 *Classification of mixtures when data are available for all ingredients or only for some ingredients of the mixture*

2.4.4.5.1 The classification of a mixture is based on summation of the concentrations of its classified ingredients. The percentage of ingredients classified as 'Acute' or 'Chronic' will feed straight into the summation method. Details of the summation method are described in 2.4.4.6.1 to 2.4.4.6.4.

- 2.4.4.5.2 Mixtures can be made of a combination of both ingredients that are classified (as Acute 1 to 3 and/or Chronic 1 to 4) and those for which adequate test data are available. When adequate toxicity data are available for more than one ingredient in the mixture, the combined toxicity of those ingredients may be calculated using the following additivity formula, and the calculated toxicity may be used to assign that portion of the mixture an acute hazard category, which is then subsequently used in applying the summation method.

$$\frac{\sum C_i}{L(E)C_{50m}} = \sum_n \frac{C_i}{L(E)C_{50i}}$$

where:

C_i = concentration of ingredient i (weight percentage)

$L(E)C_{50i}$ = LC_{50} or EC_{50} (in mg/l) for ingredient i

N = number of ingredients, and i is running from 1 to n

$L(E)C_{50m}$ = $L(E)C_{50}$ of the part of the mixture with test data

- 2.4.4.5.3 When applying the additivity formula for part of the mixture, it is preferable to calculate the toxicity of this part of the mixture using for each substance toxicity values that relate to the same species (i.e. fish, daphnia or algae) and then to use the highest toxicity (lowest value) obtained (i.e. use the most sensitive of the three species). However, when toxicity data for each ingredient are not available in the same species, the toxicity value of each ingredient shall be selected in the same manner that toxicity values are selected for the classification of substances, i.e. the highest toxicity (from the most sensitive test organism) is used. The calculated acute toxicity may then be used to classify this part of the mixture as Acute 1, 2 or 3 using the same criteria described for substances.

- 2.4.4.5.4 If a mixture is classified in more than one way, the method yielding the more conservative result shall be used.

2.4.4.6 *Summation method*

2.4.4.6.1 *Classification procedures*

In general, a more severe classification for mixtures overrides a less severe classification, e.g. a classification with Chronic 1 overrides a classification with Chronic 2. As a consequence, the classification procedure is already completed if the result of the classification is Chronic 1. A more severe classification than Chronic 1 is not possible; therefore, it is not necessary to pursue the classification procedure further.

2.4.4.6.2 *Classification for Acute Categories 1, 2 and 3*

- 2.4.4.6.2.1 First, all ingredients classified as Acute 1 shall be considered. If the sum of these ingredients is $\geq 25\%$, the whole mixture is classified as Acute 1. If the result of the calculation is a classification of the mixture as Acute 1, the classification process is completed.

- 2.4.4.6.2.2 In cases where the mixture is not classified as Acute 1, classification of the mixture as Acute 2 shall be considered. A mixture is classified as Acute 2 if 10 times the sum of all ingredients classified as Acute 1 plus the sum of all ingredients classified as Acute 2 is $\geq 25\%$. If the result of the calculation is classification of the mixture as Acute 2, the classification process is completed.

- 2.4.4.6.2.3 In cases where the mixture is not classified either as Acute 1 or Acute 2, classification of the mixture as Acute 3 shall be considered. A mixture is classified as Acute 3 if 100 times the sum of all ingredients classified as Acute 1 plus 10 times the sum of all ingredients classified as Acute 2 plus the sum of all ingredients classified as Acute 3 is $\geq 25\%$.
- 2.4.4.6.2.4 The classification of mixtures for acute hazards based on this summation of classified ingredients is summarized in Table 2.4.4.6.2.4.

Table 2.4.4.6.2.4: Classification of a mixture for acute hazards based on summation of classified ingredients

Sum of ingredients classified as:	Mixture is classified as:
Acute 1 $\times M^a \geq 25\%$	Acute 1
$(M \times 10 \times \text{Acute 1}) + \text{Acute 2} \geq 25\%$	Acute 2
$(M \times 100 \times \text{Acute 1}) + (10 \times \text{Acute 2}) + \text{Acute 3} \geq 25\%$	Acute 3

^a For explanation of the M factor, see 2.4.4.6.4.

2.4.4.6.3 *Classification for Chronic Categories 1, 2, 3 and 4*

- 2.4.4.6.3.1 First, all ingredients classified as Chronic 1 are considered. If the sum of these ingredients is $\geq 25\%$, the mixture shall be classified as Chronic 1. If the result of the calculation is a classification of the mixture as Chronic 1, the classification procedure is completed.
- 2.4.4.6.3.2 In cases where the mixture is not classified as Chronic 1, classification of the mixture as Chronic 2 shall be considered. A mixture is classified as Chronic 2 if 10 times the sum of all ingredients classified as Chronic 1 plus the sum of all ingredients classified as Chronic 2 is $\geq 25\%$. If the result of the calculation is classification of the mixture as Chronic 2, the classification process is completed.
- 2.4.4.6.3.3 In cases where the mixture is not classified either as Chronic 1 or Chronic 2, classification of the mixture as Chronic 3 shall be considered. A mixture is classified as Chronic 3 if 100 times the sum of all ingredients classified as Chronic 1 plus 10 times the sum of all ingredients classified as Chronic 2 plus the sum of all ingredients classified as Chronic 3 is $\geq 25\%$.
- 2.4.4.6.3.4 If the mixture is still not classified in Category Chronic 1, 2 or 3, classification of the mixture as Chronic 4 need not be considered for the purposes of ADN. A mixture is classified as Chronic 4 if the sum of the percentages of ingredients classified as Chronic 1, 2, 3 and 4 is $\geq 25\%$.
- 2.4.4.6.3.5 The classification of mixtures for chronic hazards based on this summation of classified ingredients is summarized in Table 2.4.4.6.3.4.

Table 2.4.4.6.3.4: Classification of a mixture for chronic hazards based on summation of classified ingredients

Sum of ingredients classified as:	Mixture is classified as:
Chronic 1 $\times M^a \geq 25\%$	Chronic 1
$(M \times 10 \times \text{Chronic 1}) + \text{Chronic 2} \geq 25\%$	Chronic 2
$(M \times 100 \times \text{Chronic 1}) + (10 \times \text{Chronic 2}) + \text{Chronic 3} \geq 25\%$	Chronic 3
$\text{Chronic 1} + \text{Chronic 2} + \text{Chronic 3} + \text{Chronic 4} \geq 25\%$	Chronic 4

^a For explanation of the M factor, see 2.4.4.6.4.

2.4.4.6.4 *Mixtures with highly toxic ingredients*

Acute Category 1 ingredients with toxicities well below 1 mg/l may influence the toxicity of the mixture and shall be given increased weight in applying the summation method. When a mixture contains ingredients classified as Acute or Chronic 1, the tiered approach described in 2.4.4.6.2 and 2.4.4.6.3 shall be applied using a weighted sum by multiplying the concentrations of Acute 1 ingredients by a factor, instead of merely adding up the percentages. This means that the concentration of “Acute 1” in the left column of Table 2.4.4.6.2.4 and the concentration of “Chronic 1” in the left column of Table 2.4.4.6.3.4 are multiplied by the appropriate multiplying factor. The multiplying factors to be applied to these ingredients are defined using the toxicity value, as summarized in Table 2.4.4.6.4 below. Therefore, in order to classify a mixture containing Acute/Chronic 1 ingredients, the classifier needs to be informed of the value of the M factor in order to apply the summation method. Alternatively, the additivity formula (see 2.4.4.5.2) may be used when toxicity data are available for all highly toxic ingredients in the mixture and there is convincing evidence that all other ingredients, including those for which specific acute toxicity data are not available, are of low or no toxicity and do not significantly contribute to the environmental hazard of the mixture.

Table 2.4.4.6.4 Multiplying factors for highly toxic ingredients of mixtures

L(E)C ₅₀ value	Multiplying factor (M)
0.1 < L(E)C ₅₀ ≤ 1	1
0.01 < L(E)C ₅₀ ≤ 0.1	10
0.001 < L(E)C ₅₀ ≤ 0.01	100
0.0001 < L(E)C ₅₀ ≤ 0.001	1 000
0.00001 < L(E)C ₅₀ ≤ 0.0001	10 000
(continue in factor 10 intervals)	

2.4.4.6.5 *Classification of mixtures with ingredients without any useable information*

In the event that no useable information on acute and/or chronic aquatic hazard is available for one or more relevant ingredients, it is concluded that the mixture cannot be attributed (a) definitive hazard category(ies). In this situation, the mixture shall be classified based on the known ingredients only, with the additional statement that: “×% of the mixture consists of (a) ingredient(s) of unknown hazards to the aquatic environment”.

PART 3

Dangerous goods list, special provisions and exemptions related to limited and excepted quantities

CHAPTER 3.1

GENERAL

3.1.1 Introduction

In addition to the provisions referred to or given in the tables of this Part, the general requirements of each Part, Chapter and/or Section are to be observed. These general requirements are not given in the tables. When a general requirement is contradictory to a special provision, the special provision prevails.

3.1.2 Proper shipping name

NOTE: For proper shipping names used for the carriage of samples, see 2.1.4.1.

3.1.2.1 The proper shipping name is that portion of the entry most accurately describing the goods in Table A or Table C in Chapter 3.2, which is shown in upper case characters (plus any numbers, Greek letters, "sec", "tert", and the letters "m", "n", "o", "p", which form an integral part of the name). Particulars concerning the vapour pressure (vp) and the boiling point (bp) in column (2) of Table C in chapter 3.2 are part of the proper shipping name. An alternative proper shipping name may be shown in brackets following the main proper shipping name. In Table A, it is shown in upper case characters (e.g., ETHANOL (ETHYL ALCOHOL)). In Table C, it is shown in lower case characters (e.g. ACETONITRILE (methyl cyanide)). Portions of an entry appearing in lower case need not be considered as part of the proper shipping name unless otherwise stated above.

3.1.2.2 When conjunctions such as "and" or "or" are in lower case or when segments of the name are punctuated by commas, the entire name of the entry need not necessarily be shown in the transport document or package markings. This is the case particularly when a combination of several distinct entries are listed under a single UN Number. Examples illustrating the selection of the proper shipping name for such entries are:

- (a) UN 1057 LIGHTERS or LIGHTER REFILLS - The proper shipping name is the most appropriate of the following possible combinations:

LIGHTERS
LIGHTER REFILLS;

- (b) UN 2793 FERROUS METAL BORINGS, SHAVINGS, TURNINGS or CUTTINGS in a form liable to self-heating. The proper shipping name is the most appropriate of the following combinations:

FERROUS METAL BORINGS
FERROUS METAL SHAVINGS
FERROUS METAL TURNINGS
FERROUS METAL CUTTINGS.

3.1.2.3 Proper shipping names may be used in the singular or plural as appropriate. In addition, when qualifying words are used as part of the proper shipping name, their sequence on documentation or package markings is optional. For instance, "DIMETHYLAMINE AQUEOUS SOLUTION" may alternatively be shown "AQUEOUS SOLUTION OF DIMETHYLAMINE". Commercial or military names for goods of Class 1 which contain the proper shipping name supplemented by additional descriptive text may be used.

3.1.2.4 Many substances have an entry for both the liquid and solid state (see definitions for liquid and solid in 1.2.1), or for the solid and solution. These are allocated separate UN numbers which are not necessarily adjacent to each other¹.

3.1.2.5 Unless it is already included in capital letters in the name indicated in Table A or Table C in Chapter 3.2, the qualifying word "MOLTEN" shall be added as part of the proper shipping name when a substance, which is a solid in accordance with the definition in 1.2.1, is offered for carriage in the molten state (e.g. ALKYLPHENOL, SOLID, N.O.S., MOLTEN).

3.1.2.6 Except for self-reactive substances and organic peroxides and unless it is already included in capital letters in the name indicated in Column (2) of Table A of Chapter 3.2, the word "STABILIZED" shall be added as part of the proper shipping name of a substance which without stabilization would be forbidden from carriage in accordance with paragraphs 2.2.X.2 due to it being liable to dangerously react under conditions normally encountered in carriage (e.g.: "TOXIC LIQUID, ORGANIC, N.O.S., STABILIZED").

When temperature control is used to stabilize such substances to prevent the development of any dangerous excess pressure, then:

(a) For liquids: (see 3.1.2.6 of ADR);

(b) For gases: the conditions of carriage shall be approved by the competent authority.

3.1.2.7 Hydrates may be carried under the proper shipping name for the anhydrous substance.

3.1.2.8 ***Generic or "not otherwise specified" (N.O.S.) names***

3.1.2.8.1 Generic and "not otherwise specified" proper shipping names that are assigned to special provision 274 in Column (6) of Table A in Chapter 3.2 or remark 27 in column (20) of Table C in Chapter 3.2 shall be supplemented with the technical name of the goods unless a national law or international convention prohibits its disclosure if it is a controlled substance. For explosive substances and articles of Class 1, the dangerous goods description may be supplemented by additional descriptive text to indicate commercial or military names. Technical names shall be entered in brackets immediately following the proper shipping name. An appropriate modifier, such as "contains" or "containing" or other qualifying words such as "mixture", "solution", etc. and the percentage of the technical constituent may also be used. For example: "UN 1993 FLAMMABLE LIQUID, N.O.S. (CONTAINS XYLENE AND BENZENE), 3, II".

3.1.2.8.1.1 The technical name shall be a recognized chemical name, if relevant a biological name, or other name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose. In the case of pesticides, only ISO common name(s), other name(s) in the World Health Organization (WHO) Recommended Classification of Pesticides by Hazard and Guidelines to Classification, or the name(s) of the active substance(s) may be used.

3.1.2.8.1.2 When a mixture of dangerous goods is described by one of the "N.O.S." or "generic" entries to which special provision 274 has been allocated in Column (6) of Table A in Chapter 3.2, or remark 27 has been allocated in column (20) of Table C in Chapter 3.2, not more than the two constituents which most predominantly contribute to the hazard or hazards of a mixture need to be shown, excluding controlled substances when their disclosure is prohibited by

¹ Details are provided in the alphabetical index (Table B of Chapter 3.2), e.g.:

NITROXYLENES, LIQUID	6.1	1665
NITROXYLENES, SOLID	6.1	3447

national law or international convention. If a package containing a mixture is labelled with any subsidiary risk label, one of the two technical names shown in parentheses shall be the name of the constituent which compels the use of the subsidiary risk label.

NOTE: see 5.4.1.2.2.

- 3.1.2.8.1.3 Examples illustrating the selection of the proper shipping name supplemented with the technical name of goods for such N.O.S. entries are:

UN 2902 PESTICIDE, LIQUID, TOXIC, N.O.S. (drazoxolon);

UN 3394 ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE (trimethylgallium).

- 3.1.2.8.1.4 Examples illustrating how the proper shipping name is supplemented in the indication of the vapour pressure or the boiling-point for N.O.S entries for carriage in tank vessels are:

UN 1268 PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S.,
110 kPa < pv50 ≤ 150 kpa;

UN 1993 FLAMMABLE LIQUID, N.O.S. (ACETONE with more than 10% BENZENE),
pv 50 ≤ 110 kPa, 85° C < bp ≤ 115° C.

3.1.2.9 *Mixtures and solutions containing one dangerous substance*

When mixtures and solutions have to be regarded as the dangerous substance mentioned by name in accordance with the classification requirements of 2.1.3.3, the qualifying word "SOLUTION" or "MIXTURE", as appropriate, shall be added as part of the proper shipping name, e.g. "ACETONE SOLUTION". In addition, the concentration of the solution or mixture may also be indicated, e.g. "ACETONE 75% SOLUTION".

CHAPTER 3.2

DANGEROUS GOODS LIST

3.2.1 Table A: List of dangerous goods in numerical order

Explanations concerning Table A:

As a rule, each row of Table A deals with the substance(s) or article(s) covered by a specific UN number or an identification number. However, when substances or articles belonging to the same UN number have different chemical properties, physical properties and/or carriage conditions, several consecutive rows may be used for that UN number or identification number.

Each column of Table A is dedicated to a specific subject as indicated in the explanatory notes below. The intersection of columns and rows (cell) contains information concerning the subject treated in that column, for the substance(s) or article(s) of that row:

- The first four cells identify the substance(s) or article(s) belonging to that row (additional information in that respect may be given by the special provisions referred to in Column (6));
- The following cells give the applicable special provisions, either in the form of complete information or in coded form. The codes cross-refer to detailed information that is to be found in the numbers indicated in the explanatory notes below. An empty cell means either that there is no special provision and that only the general requirements apply, or that the carriage restriction indicated in the explanatory notes is in force.

The applicable general requirements are not referred to in the corresponding cells.

Explanatory notes for each column:

Column (1) “UN number/identification number”.

Contains the UN number or the identification number:

- of the dangerous substance or article if the substance or article has been assigned its own specific UN number or identification number, or
- of the generic or n.o.s. entry to which the dangerous substances or articles not mentioned by name shall be assigned in accordance with the criteria (“decision trees”) of Part 2.

Column (2) “Name and description”

Contains, in upper case characters, the name of the substance or article, if the substance or article has been assigned its own specific UN number or identification number, or of the generic or n.o.s. entry to which it has been assigned in accordance with the criteria (“decision trees”) of Part 2. This name shall be used as the proper shipping name or, when applicable, as part of the proper shipping name (see 3.1.2 for further details on the proper shipping name).

A descriptive text in lower case characters is added after the proper shipping name to clarify the scope of the entry if the classification and/or carriage conditions of the substance or article may be different under certain conditions.

Column (3a)	“Class”
	Contains the number of the Class, whose heading covers the dangerous substance or article. This Class number is assigned in accordance with the procedures and criteria of Part 2.
Column (3b)	“Classification code”
	Contains the classification code of the dangerous substance or article.
	<ul style="list-style-type: none">– For dangerous substances or articles of Class 1, the code consists of a division number and compatibility group letter, which are assigned in accordance with the procedures and criteria of 2.2.1.1.4.– For dangerous substances or articles of Class 2, the code consists of a number and one or more letters representing the hazardous property group, which are explained in 2.2.2.1.2 and 2.2.2.1.3.– For dangerous substances or articles of Classes 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 6.2, 8 and 9, the codes are explained in 2.2.x.1.2.¹– Dangerous substances or articles of Class 7 do not have a classification code.
Column (4)	“Packing group”
	Contains the packing group number(s) (I, II or III) assigned to the dangerous substance. These packing group numbers are assigned on the basis of the procedures and criteria of Part 2. Certain articles and substances are not assigned to packing groups.
Column (5)	“Labels”
	Contains the model number of the labels/placards (see 5.2.2.2 and 5.3.1.1.7) that have to be affixed to packages, containers, tank-containers, portable tanks, MEGCs, vehicles and wagons. However:
	<ul style="list-style-type: none">– For substances or articles of Class 7, 7X means label model No. 7A, 7B or 7C as appropriate according to the category (see 5.1.5.3.4 and 5.2.2.1.11.1) or placard No. 7D (see 5.3.1.1.3 and 5.3.1.1.7.2).
	The general provisions on labelling/placarding (e.g. number of labels, their location) are to be found in 5.2.2.1 for packages, and in 5.3.1, for containers, tank-containers, MEGCs, portable tanks, vehicles and wagons.

¹ *x = the Class number of the dangerous substance or article, without dividing point if applicable.*

NOTE: Special provisions, indicated in Column (6), may change the above labelling provisions.

Column (6)	“Special provisions”
	Contains the numeric codes of special provisions that have to be met. These provisions concern a wide array of subjects, mainly connected with the contents of Columns (1) to (5) (e.g. carriage prohibitions, exemptions from certain requirements, explanations concerning the classification of certain forms of the dangerous goods concerned and additional labelling or marking provisions), and are listed in Chapter 3.3 in numerical order. If Column (6) is empty, no special provisions apply to the contents of Columns (1) to (5) for the dangerous goods concerned. Special provisions specific to inland navigation begin at 800.
Column (7a)	“Limited Quantities”
	Contains an alphanumeric code with the following meaning: <ul style="list-style-type: none">– “LQ0” signifies that no exemption from the provisions of ADN exists for the dangerous goods packed in limited quantities;– All the other alphanumeric codes starting with the letters “LQ” signify that the provisions of ADN are not applicable if the conditions indicated in Chapter 3.4 are fulfilled.
Column (7b)	“Excepted Quantities”
	Contains an alphanumeric code with the following meaning: <ul style="list-style-type: none">– “E0” signifies that no exemption from the provisions of ADN exists for the dangerous goods packed in excepted quantities;– All the other alphanumeric codes starting with the letter “E” signify that the provisions of ADN are not applicable if the conditions indicated in Chapter 3.5 are fulfilled.
Column (8)	“Carriage permitted”
	This column contains the alphabetic codes concerning the permitted form of carriage in inland navigation vessels. If column (8) is empty, the substance or article may only be carried in packages. If column (8) contains code “B”, carriage is permitted in packages or in bulk (see 7.1.1.11). If column (8) contains code “T”, carriage is permitted in packages and in tank vessels. In the event of carriage in tank vessels, the requirements of Table C are applicable (see 7.2.1.21). If “carriage prohibited” appears in column (8), carriage is not permitted. If “free” appears in column (8), the substance is not subject to the requirements of ADN.

Column (9)	“Equipment required” This column contains the alphanumeric codes for the equipment required for the carriage of the dangerous substance or article (see 8.1.5).
Column (10)	“Ventilation” This column contains the alphanumeric codes of the special requirements concerning ventilation applicable to carriage with the following meaning: <ul style="list-style-type: none">– alphanumeric codes starting with the letters “VE” mean that special additional conditions are applicable to carriage. These can be found in 7.1.6.12 and establish special requirements.
Column (11)	“Provisions concerning loading, unloading and carriage” This column contains the alphanumeric codes of the special requirements applicable to carriage with the following meaning: <ul style="list-style-type: none">– alphanumeric codes starting with the letters “CO”, “ST” and “RA” mean that special additional conditions are applicable to carriage in bulk. These can be found in 7.1.6.11 and establish special requirements.– alphanumeric codes starting with the letters “LO” mean that special additional conditions are applicable prior to loading. These can be found in 7.1.6.13 and establish special requirements.– alphanumeric codes starting with the letters “HA” mean that special additional conditions are applicable to the handling and stowage of the cargo. These can be found in 7.1.6.14 and establish special requirements.– alphanumeric codes starting with the letters “IN” mean that special additional conditions are applicable to the inspection of holds during carriage. These can be found in 7.1.6.16 and establish special requirements.
Column (12)	“Number of blue cones/lights” This column contains the number of cones/lights which should constitute the marking of the vessel during the carriage of this dangerous substance or article (see 7.1.5).
Column (13)	“Additional requirements/Remarks” This column contains additional requirements or observations concerning the carriage of this dangerous substance or article

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0004	3.1.2 AMMONIUM PICRATE dry or wetted with less than 10% water, by mass	1	2.2 1.1D	2.1.1.3	5.2.2 1	3.3	3.4.6 LQ0	3.2.1 E0	8.1.5 PP	7.1.6	LO01 HA01, HA02, HA03, HA04, HA05, HA06	7.1.5 3	3.2.1 (13)
0005	CARTRIDGES FOR WEAPONS with bursting charge	1	1.1F		1		LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0006	CARTRIDGES FOR WEAPONS with bursting charge	1	1.1E		1		LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0007	CARTRIDGES FOR WEAPONS with bursting charge	1	1.2F		1		LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0009	AMMUNITION, INCENDIARY with or without burster, expelling charge or propelling charge	1	1.2G		1		LQ0	E0	PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0010	AMMUNITION, INCENDIARY with or without burster, expelling charge or propelling charge	1	1.3G		1		LQ0	E0	PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0012	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1	1.4S		1,4		LQ0	E0	PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0014	CARTRIDGES FOR WEAPONS, BLANK or CARTRIDGES, SMALL ARMS, BLANK	1	1.4S		1,4		LQ0	E0	PP		LO01 HA01, HA03, HA04, HA05, HA06	0	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.2G	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) LQ0	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11) LO01, HA01, HA03, HA04, HA05, HA06	7.1.5 (12)	3.2.1 (13)
0015	AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge	1	1.2G		1		E0		PP			3	
0015	AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge, containing corrosive substances	1	1.2G		1 +8		E0		PP			3	
0016	AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge	1	1.3G		1		E0		PP			3	
0016	AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge, containing corrosive substances	1	1.3G		1 +8		E0		PP			3	
0018	AMMUNITION, TEAR-PRODUCING with burster, expelling charge or propelling charge	1	1.2G		1+6.1+8	802	E0		PP			3	
0019	AMMUNITION, TEAR-PRODUCING with burster, expelling charge or propelling charge	1	1.3G		1+6.1+8	802	E0		PP			3	
0020	AMMUNITION, TOXIC with burster, expelling charge or propelling charge	1	1.2K										
0021	AMMUNITION, TOXIC with burster, expelling charge or propelling charge	1	1.3K										
0027	BLACK POWDER (GUNPOWDER), granular or as a meal	1	1.1D		1		E0		PP			3	
0028	BLACK POWDER (GUNPOWDER), COMPRESSED or BLACK POWDER (GUNPOWDER), IN PELLETS	1	1.1D		1		E0		PP			3	

CARRIAGE PROHIBITED

CARRIAGE PROHIBITED

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks	
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(12)	(13)
0029	3.1.2 (2) DETONATORS, NON-ELECTRIC for blasting	2.2 (3a)	2.2 (3b) 1.1B	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) LQ0	3.5.1.2 (7b) E0	3.2.1 (8)	8.1.5 (9) PP	7.1.6 (10)	7.1.6 (11) LO01 HA01, HA02, HA03, HA04, HA05, HA06	7.1.5 (12) 3	3.2.1 (13)
0030	DETONATORS, ELECTRIC for blasting	1	1.1B		1		LQ0	E0		PP			3	
0033	BOMBS with bursting charge	1	1.1F		1		LQ0	E0		PP			3	
0034	BOMBS with bursting charge	1	1.1D		1		LQ0	E0		PP			3	
0035	BOMBS with bursting charge	1	1.2D		1		LQ0	E0		PP			3	
0037	BOMBS, PHOTO-FLASH	1	1.1F		1		LQ0	E0		PP			3	
0038	BOMBS, PHOTO-FLASH	1	1.1D		1		LQ0	E0		PP			3	
0039	BOMBS, PHOTO-FLASH	1	1.2G		1		LQ0	E0		PP			3	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.1D	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) LQ0	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11) LO01, HA01, HA02, HA03, HA04, HA05, HA06	7.1.5 (12)	3.2.1 (13)
0042	BOOSTERS without detonator	1	1.1D		1		E0		PP			3	
0043	BURSTERS, explosive	1	1.1D		1		E0		PP			3	
0044	PRIMERS, CAP TYPE	1	1.4S		1,4		E0		PP			0	
0048	CHARGES, DEMOLITION	1	1.1D		1		E0		PP			3	
0049	CARTRIDGES, FLASH	1	1.1G		1		E0		PP			3	
0050	CARTRIDGES, FLASH	1	1.3G		1		E0		PP			3	
0054	CARTRIDGES, SIGNAL	1	1.3G		1		E0		PP			3	
0055	CASES, CARTRIDGE, EMPTY, WITH PRIMER	1	1.4S		1,4		E0		PP			0	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/ lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.1D	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) LQ0	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11) LO01, HA01, HA02, HA03, HA04, HA05, HA06	7.1.5 (12)	3.2.1 (13)
0056	CHARGES, DEPTH	1	1.1D		1		E0		PP			3	
0059	CHARGES, SHAPED without detonator	1	1.1D		1		E0		PP			3	
0060	CHARGES, SUPPLEMENTARY, EXPLOSIVE	1	1.1D		1		E0		PP			3	
0065	CORD, DETONATING, flexible	1	1.1D		1		E0		PP			3	
0066	CORD, IGNITER	1	1.4G		1,4		E0		PP			1	
0070	CUTTERS, CABLE, EXPLOSIVE	1	1.4S		1,4		E0		PP			0	
0072	CYCLOTRIMETHYLENE-TRINITRAMINE (CYCLONITE; HEXOGEN; RDX), WETTED with not less than 15% water, by mass	1	1.1D		1	266	E0		PP			3	
0073	DETONATORS FOR AMMUNITION	1	1.1B		1		E0		PP			3	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks	
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(12)	(13)
0074	DIAZODINITROPHENOL, WETTED with not less than 40% water, or mixture of alcohol and water, by mass	1	1.1A		1	266	LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3		
0075	DIETHYLENEGLYCOL DINITRATE, DESENSITIZED with not less than 2.5% non-volatile, water-insoluble phlegmatizer, by mass	1	1.1D		1	266	LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3		
0076	DINITROPHENOL, dry or wetted with less than 15% water, by mass	1	1.1D		1+6.1	802	LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3		
0077	DINITROPHENOLATES, alkali metals, dry or wetted with less than 15% water, by mass	1	1.3C		1+6.1	802	LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3		
0078	DINITRORESORCINOL, dry or wetted with less than 15% water, by mass	1	1.1D		1		LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3		
0079	HEXANITRODIPHENYLAMINE (DIPICRYLAMINE; HEXYL)	1	1.1D		1		LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3		
0081	EXPLOSIVE, BLASTING, TYPE A	1	1.1D		1	616 617	LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3		

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks	
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.1D	2.1.1.3 (4)	5.2.2 (5)	3.3 (6) 617	3.4.6 (7a) LQ0	3.5.1.2 (7b) E0	3.2.1 (8)	8.1.5 (9) PP	7.1.6 (10)	7.1.6 (11) LO01 HA01, HA02, HA03, HA04, HA05, HA06	7.1.5 (12) 3	3.2.1 (13)
0082	EXPLOSIVE, BLASTING, TYPE B	1	1.1D		1	617	LQ0	E0				3		
0083	EXPLOSIVE, BLASTING, TYPE C	1	1.1D		1	267 617	LQ0	E0	PP			3		
0084	EXPLOSIVE, BLASTING, TYPE D	1	1.1D		1	617	LQ0	E0	PP			3		
0092	FLARES, SURFACE	1	1.3G		1		LQ0	E0	PP			3		
0093	FLARES, AERIAL	1	1.3G		1		LQ0	E0	PP			3		
0094	FLASH POWDER	1	1.1G		1		LQ0	E0	PP			3		
0099	FRACTURING DEVICES, EXPLOSIVE without detonator, for oil wells	1	1.1D		1		LQ0	E0	PP			3		
0101	FUSE, NON-DETONATING	1	1.3G		1		LQ0	E0	PP			3		

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.2D	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) LQ0	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
0102	CORD (FUSE), DETONATING, metal clad	1	1.2D		1		E0		PP		LO01, HA01, HA03, HA04, HA05, HA06	3	
0103	FUSE, IGNITER, tubular, metal clad	1	1.4G		1,4		E0		PP		LO01, HA01, HA03, HA04, HA05, HA06	1	
0104	CORD (FUSE), DETONATING, MILD EFFECT metal clad	1	1.4D		1,4		E0		PP		LO01, HA01, HA03, HA04, HA05, HA06	1	
0105	FUSE, SAFETY	1	1.4S		1,4		E0		PP		LO01, HA01, HA03, HA04, HA05, HA06	0	
0106	FUZES, DETONATING	1	1.1B		1		E0		PP		LO01, HA01, HA02, HA03, HA04, HA05, HA06	3	
0107	FUZES, DETONATING	1	1.2B		1		E0		PP		LO01, HA01, HA02, HA03, HA04, HA05, HA06	3	
0110	GRENADES, PRACTICE, hand or rifle	1	1.4S		1,4		E0		PP		LO01, HA01, HA03, HA04, HA05, HA06	0	
0113	GUANYLNITROSAMINOQUANYLIDENE HYDRAZINE, WETTED with not less than 30% water, by mass	1	1.1A		1	266	E0		PP		LO01, HA01, HA02, HA03, HA04, HA05, HA06	3	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.1A	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) LQ0	3.5.1.2 (7b) E0	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
0114	GUANYL-NITROSAMINO-GUANYL-TETRAZENE (TETRAZENE), WETTED with not less than 30% water, or mixture of alcohol and water, by mass	1	1.1A		1	266	LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0118	HEXOLITE (HEXOTOL), dry or wetted with less than 15% water, by mass	1	1.1D		1		LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0121	IGNITERS	1	1.1G		1		LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0124	JET PERFORATING GUNS, CHARGED, oil well, without detonator	1	1.1D		1		LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0129	LEAD AZIDE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	1	1.1A		1	266	LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0130	LEAD STYPHNATE (LEAD TRINITRORESORCINATE), WETTED with not less than 20% water, or mixture of alcohol and water, by mass	1	1.1A		1	266	LQ0	E0	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0131	LIGHTERS, FUSE	1	1.4S		1,4		LQ0	E0	PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0132	DEFLAGRATING METAL SALTS OF AROMATIC NITRODERIVATIVES, N.O.S.	1	1.3C		1	274	LQ0	E0	PP		LO01 HA01, HA03, HA04, HA05, HA06	3	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
0133	MANNITOL HEXANITRATE (NITROMANNITE), WETTED with not less than 40% water, or mixture of alcohol and water, by mass	1	1.1D		1	266	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0135	MERCURY FULMINATE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	1	1.1A		1	266	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0136	MINES with bursting charge	1	1.1F		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0137	MINES with bursting charge	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0138	MINES with bursting charge	1	1.2D		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0143	NITROGLYCERIN, DESENSITIZED with not less than 40% non-volatile water-insoluble phlegmatizer, by mass	1	1.1D		1+6.1	266 271 802	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0144	NITROGLYCERIN SOLUTION IN ALCOHOL with more than 1% but not more than 10% nitroglycerin	1	1.1D		1	500	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.1D	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) LQ0	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
0146	NITROSTARCH, dry or wetted with less than 20% water, by mass	1	1.1D		1		E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0147	NITRO UREA	1	1.1D		1		E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0150	PENTAERYTHRITOL TETRANITRATE (PENTAERYTHRITOL TETRANITRATE; PETN), WETTED with not less than 25% water, by mass, or DESENSITIZED with not less than 15% phlegmatizer, by mass	1	1.1D		1	266	E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0151	PENTOLITE, dry or wetted with less than 15% water, by mass	1	1.1D		1		E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0153	TRINITROANILINE (PICRAMIDE)	1	1.1D		1		E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0154	TRINITROPHENOL (PICRIC ACID), dry or wetted with less than 30% water, by mass	1	1.1D		1		E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	1	
0155	TRINITROCHLOROBENZENE (PICRYL CHLORIDE)	1	1.1D		1		E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.3C	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) LQ0 E0	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
0159	POWDER CAKE (POWDER PASTE), WETTED with not less than 25% water, by mass	1	1.3C		1	266	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0160	POWDER, SMOKELESS	1	1.1C		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0161	POWDER, SMOKELESS	1	1.3C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0167	PROJECTILES with bursting charge	1	1.1F		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0168	PROJECTILES with bursting charge	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0169	PROJECTILES with bursting charge	1	1.2D		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0171	AMMUNITION, ILLUMINATING with or without burster, expelling charge or propelling charge	1	1.2G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0173	RELEASE DEVICES, EXPLOSIVE	1	1.4S		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0174	3.1.2 RIVETS, EXPLOSIVE	1	2.2 1.4S	2.1.1.3	5.2.2 1,4	3.3	3.4.6 LQ0 E0	3.2.1	8.1.5 PP	7.1.6	7.1.6 LO01 HA01, HA03, HA04, HA05, HA06	7.1.5 0	3.2.1 (13)
0180	ROCKETS with bursting charge	1	1.1F		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0181	ROCKETS with bursting charge	1	1.1E		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0182	ROCKETS with bursting charge	1	1.2E		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0183	ROCKETS with inert head	1	1.3C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0186	ROCKET MOTORS	1	1.3C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0190	SAMPLES, EXPLOSIVE, other than initiating explosive	1				16 274	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0191	SIGNAL DEVICES, HAND	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	

UN No. or ID No.	Name and description	Class (3a)	Classification Code (3b)	Packing group (4)	Labels (5)	Special provisions (6)	Limited and excepted quantities (7a)	3.4.6 (7b)	3.5.1.2 (7c)	Carriage permitted (8)	Equipment required (9)	Ventilation (10)	7.1.6 (11)	Provisions concerning loading, unloading and carriage (11)	Number of blue cones/lights (12)	Remarks (13)
0192	3.1.2 (2) SIGNALS, RAILWAY TRACK, EXPLOSIVE	2.2	2.2 1.1G	2.1.1.3 (4)	5.2.2 (5) 1	3.3 (6)	3.4.6 (7a) LQ0	E0	3.5.1.2 (7c)	3.2.1 (8)	8.1.5 (9) PP	7.1.6 (10)	7.1.6 (11) LO01 HA01, HA02, HA03, HA04, HA05, HA06	7.1.5 (12) 3	3.2.1 (13) (13)	
0193	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1	1.4S		1,4		LQ0	E0			PP		LO01 HA01, HA03, HA04, HA05, HA06	0		
0194	SIGNALS, DISTRESS, ship	1	1.1G		1		LQ0	E0			PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3		
0195	SIGNALS, DISTRESS, ship	1	1.3G		1		LQ0	E0			PP		LO01 HA01, HA03, HA04, HA05, HA06	3		
0196	SIGNALS, SMOKE	1	1.1G		1		LQ0	E0			PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3		
0197	SIGNALS, SMOKE	1	1.4G		1,4		LQ0	E0			PP		LO01 HA01, HA03, HA04, HA05, HA06	1		
0204	SOUNDING DEVICES, EXPLOSIVE	1	1.2F		1		LQ0	E0			PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3		
0207	TETRANITROANILINE	1	1.1D		1		LQ0	E0			PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3		

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.1D	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) LQ0	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11) LO01, HA01, HA02, HA03, HA04, HA05, HA06	7.1.5 (12)	3.2.1 (13)
0208	TRINITROPHENYLMETHYLNITRAMINE (TETRYL)	1	1.1D		1		E0		PP			3	
0209	TRINITROTOLUENE (TNT), dry or wetted with less than 30% water, by mass	1	1.1D		1		E0		PP			3	
0212	TRACERS FOR AMMUNITION	1	1.3G		1		E0		PP			3	
0213	TRINITROANISOLE	1	1.1D		1		E0		PP			3	
0214	TRINITROBENZENE, dry or wetted with less than 30% water, by mass	1	1.1D		1		E0		PP			3	
0215	TRINITROBENZOIC ACID, dry or wetted with less than 30% water, by mass	1	1.1D		1		E0		PP			3	
0216	TRINITRO-m-CRESOL	1	1.1D		1		E0		PP			3	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0217	3.1.2 TRINITRONAPHTHALENE	1	2.2 1.1D	2.1.1.3	5.2.2 1	3.3	3.4.6 LQ0 E0	3.2.1	8.1.5 PP	7.1.6	LO01 HA01, HA02, HA03, HA04, HA05, HA06	7.1.5 3	3.2.1 (13)
0218	TRINITROPHENETOLE	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0219	TRINITRORESORCINOL (STYPHINIC ACID), dry or wetted with less than 20% water, or mixture of alcohol and water, by mass	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0220	UREA NITRATE, dry or wetted with less than 20% water, by mass	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0221	WARHEADS, TORPEDO with bursting charge	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0222	AMMONIUM NITRATE with more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0224	BARIUM AZIDE, dry or wetted with less than 50% water, by mass	1	1.1A		1+6.1	802	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0225	3.1.2 (2) BOOSTERS WITH DETONATOR	2.2 (3a)	2.2 (3b) 1.1B	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) LQ0 E0	3.2.1 (8)	8.1.5 (9) PP	7.1.6 (10)	7.1.6 (11) LO01 HA01, HA02, HA03, HA04, HA05, HA06	7.1.5 (12) 3	3.2.1 (13)
0226	CYCLOTETRAMETHYLENE-TETRAMINE (HMX; OCTOGEN), WETTED with not less than 15% water, by mass	1	1.1D		1	266	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0234	SODIUM DINITRO-o-CRESOLATE, dry or wetted with less than 15% water, by mass	1	1.3C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0235	SODIUM PICRAMATE, dry or wetted with less than 20% water, by mass	1	1.3C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0236	ZIRCONIUM PICRAMATE, dry or wetted with less than 20% water, by mass	1	1.3C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0237	CHARGES, SHAPED, FLEXIBLE, LINEAR	1	1.4D		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0238	ROCKETS, LINE-THROWING	1	1.2G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0240	ROCKETS, LINE-THROWING	1	1.3G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(12)	(13)
0241	3.1.2 EXPLOSIVE, BLASTING, TYPE E	1	2.2 1.1D	2.1.1.3	5.2.2 1	3.3 617	3.4.6 LQ0	3.5.1.2 E0	3.2.1	8.1.5 PP	7.1.6	7.1.6 LO01 HA01, HA02, HA03, HA04, HA05, HA06	7.1.5 3	3.2.1 (13)
0242	CHARGES, PROPELLING, FOR CANNON	1	1.3C		1		LQ0	E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0243	AMMUNITION, INCENDIARY, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	1	1.2H		1		LQ0	E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0244	AMMUNITION, INCENDIARY, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	1	1.3H		1		LQ0	E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0245	AMMUNITION, SMOKE, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	1	1.2H		1		LQ0	E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0246	AMMUNITION, SMOKE, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	1	1.3H		1		LQ0	E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0247	AMMUNITION, INCENDIARY, liquid or gel, with burster, expelling charge or propelling charge	1	1.3J		1		LQ0	E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0248	CONTRIVANCES, WATER-ACTIVATED with buster, expelling charge or propelling charge	1	1.2L		1	274	LQ0	E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0249	CONTRIVANCES, WATER-ACTIVATED with buster, expelling charge or propelling charge	1	1.3L		1	274	LQ0	E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0250	3.1.2 (2) ROCKET MOTORS WITH HYPERGOLIC LIQUIDS with or without expelling charge	2.2	2.2 (3b) 1.3L	2.1.1.3 (4)	5.2.2 (5) 1	3.3 (6)	3.4.6 (7a) LQ0 E0	3.2.1 (8)	8.1.5 (9) PP	7.1.6 (10)	7.1.6 (11) LO01 HA01, HA03, HA04, HA05, HA06	7.1.5 (12) 3	3.2.1 (13)
0254	AMMUNITION, ILLUMINATING with or without burster, expelling charge or propelling charge	1	1.3G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0255	DETONATORS, ELECTRIC for blasting	1	1.4B		1,4		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	1	
0257	FUZES, DETONATING	1	1.4B		1,4		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	1	
0266	OCTOLITE (OCTOL), dry or wetted with less than 15% water, by mass	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0267	DETONATORS, NON-ELECTRIC for blasting	1	1.4B		1,4		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	1	
0268	BOOSTERS WITH DETONATOR	1	1.2B		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0271	CHARGES, PROPELLING	1	1.1C		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.3C	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) LQ0	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
0272	CHARGES, PROPELLING	1	1.3C		1		E0		PP		LO01, HA01, HA03, HA04, HA05, HA06	3	
0275	CARTRIDGES, POWER DEVICE	1	1.3C		1		E0		PP		LO01, HA01, HA03, HA04, HA05, HA06	3	
0276	CARTRIDGES, POWER DEVICE	1	1.4C		1,4		E0		PP		LO01, HA01, HA03, HA04, HA05, HA06	1	
0277	CARTRIDGES, OIL WELL	1	1.3C		1		E0		PP		LO01, HA01, HA03, HA04, HA05, HA06	3	
0278	CARTRIDGES, OIL WELL	1	1.4C		1,4		E0		PP		LO01, HA01, HA03, HA04, HA05, HA06	1	
0279	CHARGES, PROPELLING, FOR CANNON	1	1.1C		1		E0		PP		LO01, HA01, HA02, HA03, HA04, HA05, HA06	3	
0280	ROCKET MOTORS	1	1.1C		1		E0		PP		LO01, HA01, HA02, HA03, HA04, HA05, HA06	3	
0281	ROCKET MOTORS	1	1.2C		1		E0		PP		LO01, HA01, HA03, HA04, HA05, HA06	3	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0282	NITROGUANIDINE (PICRIT), dry or wetted with less than 20% water, by mass	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0283	BOOSTERS without detonator	1	1.2D		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0284	GRENADES, hand or rifle, with bursting charge	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0285	GRENADES, hand or rifle, with bursting charge	1	1.2D		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0286	WARHEADS, ROCKET with bursting charge	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0287	WARHEADS, ROCKET with bursting charge	1	1.2D		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0288	CHARGES, SHAPED, FLEXIBLE, LINEAR	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0289	CORD, DETONATING, flexible	1	1.4D		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/ lights	Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a) 3.4.6 (7b) 3.5.1.2	(8) 3.2.1	(9) 8.1.5	(10) 7.1.6	(11) 7.1.6	(12) 7.1.5	(13) 3.2.1
0290	CORD (FUSE), DETONATING, metal clad	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0291	BOMBS with bursting charge	1	1.2F		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0292	GRENADES, hand or rifle, with bursting charge	1	1.1F		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0293	GRENADES, hand or rifle, with bursting charge	1	1.2F		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0294	MINES with bursting charge	1	1.2F		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0295	ROCKETS with bursting charge	1	1.2F		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0296	SOUNDING DEVICES, EXPLOSIVE	1	1.1F		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/ lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
0297	AMMUNITION, ILLUMINATING with or without burster, expelling charge or propelling charge	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0299	BOMBS, PHOTO-FLASH	1	1.3G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0300	AMMUNITION, INCENDIARY with or without burster, expelling charge or propelling charge	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0301	AMMUNITION, TEAR-PRODUCING with burster, expelling charge or propelling charge	1	1.4G		1.4+6.1+8	802	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0303	AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0303	AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge, containing corrosive substances	1	1.4G		1.4+8		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0305	FLASH POWDER	1	1.3G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0306	TRACERS FOR AMMUNITION	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0312	CARTRIDGES, SIGNAL	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/ lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
0313	SIGNALS, SMOKE	1	1.2G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0314	IGNITERS	1	1.2G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0315	IGNITERS	1	1.3G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0316	FUZES, IGNITING	1	1.3G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0317	FUZES, IGNITING	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0318	GRENADES, PRACTICE, hand or rifle	1	1.3G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0319	PRIMERS, TUBULAR	1	1.3G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0320	PRIMERS, TUBULAR	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0321	CARTRIDGES FOR WEAPONS with bursting charge	1	1.2E		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a) 3.4.6 (7b) 3.5.1.2	(8) 3.2.1	(9) 8.1.5	(10) 7.1.6	(11) 7.1.6	(12) 7.1.5	(13) 3.2.1
0322	ROCKET MOTORS WITH HYPERGOLIC LIQUIDS with or without expelling charge	1	1.2L		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0323	CARTRIDGES, POWER DEVICE	1	1.4S		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0324	PROJECTILES with bursting charge	1	1.2F		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0325	IGNITERS	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0326	CARTRIDGES FOR WEAPONS, BLANK	1	1.1C		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0327	CARTRIDGES FOR WEAPONS, BLANK or CARTRIDGES, SMALL ARMS, BLANK	1	1.3C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0328	CARTRIDGES FOR WEAPONS, INERT PROJECTILE	1	1.2C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0329	TORPEDOES with bursting charge	1	1.1E		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a) (7b)	(8)	(9)	(10)	(11)	(12)	(13)
0330	3.1.2 (2) TORPEDOES with bursting charge	2.2 (3a)	2.2 (3b) 1.1F	2.1.1.3 (4)	5.2.2 (5) 1	3.3 (6)	3.4.6 (7a) LQ0 E0	3.2.1 (8)	8.1.5 (9) PP	7.1.6 (10)	LO01 HA01, HA02, HA03, HA04, HA05, HA06	7.1.5 (12) 3	3.2.1 (13)
0331	EXPLOSIVE, BLASTING, TYPE B (AGENT, BLASTING, TYPE B)	1	1.5D		1,5	617	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0332	EXPLOSIVE, BLASTING, TYPE E (AGENT, BLASTING, TYPE B)	1	1.5D		1,5	617	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0333	FIREWORKS	1	1.1G		1	645	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0334	FIREWORKS	1	1.2G		1	645	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0335	FIREWORKS	1	1.3G		1	645	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0336	FIREWORKS	1	1.4G		1,4	645 651	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0337	FIREWORKS	1	1.4S		1,4	645	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.4C	2.1.1.3 (4)	5.2.2 (5) 1,4	3.3 (6)	3.4.6 (7a) LQ0 E0	3.2.1 (8)	8.1.5 (9) PP	7.1.6 (10)	7.1.6 (11) LO01 HA01, HA03, HA04, HA05, HA06	7.1.5 (12)	3.2.1 (13)
0338	CARTRIDGES FOR WEAPONS, BLANK or CARTRIDGES, SMALL ARMS, BLANK	1	1.4C		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0339	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1	1.4C		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0340	NITROCELLULOSE, dry or wetted with less than 25% water (or alcohol), by mass	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0341	NITROCELLULOSE, unmodified or plasticized with less than 18% plasticizing substance, by mass	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0342	NITROCELLULOSE, WETTED with not less than 25% alcohol, by mass	1	1.3C		1	105	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0343	NITROCELLULOSE, PLASTICIZED with not less than 18% plasticizing substance, by mass	1	1.3C		1	105	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0344	PROJECTILES with bursting charge	1	1.4D		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0345	PROJECTILES, inert with tracer	1	1.4S		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0346	PROJECTILES with burster or expelling charge	1	2.2 1.2D	2.1.1.3	5.2.2 1	3.3	3.4.6 LQ0	3.2.1 E0	8.1.5 PP	7.1.6	7.1.6 LO01, HA01, HA03, HA04, HA05, HA06	7.1.5 3	3.2.1 (13)
0347	PROJECTILES with burster or expelling charge	1	1.4D		1,4		LQ0	E0	PP		LO01, HA01, HA03, HA04, HA05, HA06	1	
0348	CARTRIDGES FOR WEAPONS with bursting charge	1	1.4F		1,4		LQ0	E0	PP		LO01, HA01, HA02, HA03, HA04, HA05, HA06	1	
0349	ARTICLES, EXPLOSIVE, N.O.S.	1	1.4S		1,4	178 274	LQ0	E0	PP		LO01, HA01, HA03, HA04, HA05, HA06	0	
0350	ARTICLES, EXPLOSIVE, N.O.S.	1	1.4B		1,4	178 274	LQ0	E0	PP		LO01, HA01, HA02, HA03, HA04, HA05, HA06	1	
0351	ARTICLES, EXPLOSIVE, N.O.S.	1	1.4C		1,4	178 274	LQ0	E0	PP		LO01, HA01, HA03, HA04, HA05, HA06	1	
0352	ARTICLES, EXPLOSIVE, N.O.S.	1	1.4D		1,4	178 274	LQ0	E0	PP		LO01, HA01, HA03, HA04, HA05, HA06	1	
0353	ARTICLES, EXPLOSIVE, N.O.S.	1	1.4G		1,4	178 274	LQ0	E0	PP		LO01, HA01, HA03, HA04, HA05, HA06	1	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0354	ARTICLES, EXPLOSIVE, N.O.S.	1	1.1L		1	178 274	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0355	ARTICLES, EXPLOSIVE, N.O.S.	1	1.2L		1	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0356	ARTICLES, EXPLOSIVE, N.O.S.	1	1.3L		1	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0357	SUBSTANCES, EXPLOSIVE, N.O.S.	1	1.1L		1	178 274	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0358	SUBSTANCES, EXPLOSIVE, N.O.S.	1	1.2L		1	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0359	SUBSTANCES, EXPLOSIVE, N.O.S.	1	1.3L		1	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0360	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	1	1.1B		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0361	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	1	1.4B		1,4		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	1	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a) 3.4.6	(8) 3.2.1	(9) 8.1.5	(10) 7.1.6	(11) 7.1.6	(12) 7.1.5	(13) 3.2.1
							(7b) 3.5.1.2						
0362	AMMUNITION, PRACTICE	1	1.4G		1,4		E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0363	AMMUNITION, PROOF	1	1.4G		1,4		E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0364	DETONATORS FOR AMMUNITION	1	1.2B		1		E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0365	DETONATORS FOR AMMUNITION	1	1.4B		1,4		E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	1	
0366	DETONATORS FOR AMMUNITION	1	1.4S		1,4		E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0367	FUZES, DETONATING	1	1.4S		1,4		E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0368	FUZES, IGNITING	1	1.4S		1,4		E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0369	WARHEADS, ROCKET with bursting charge	1	1.1F		1		E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0370	WARHEADS, ROCKET with burster or expelling charge	1	1.4D		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0371	WARHEADS, ROCKET with burster or expelling charge	1	1.4F		1,4		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	1	
0372	GRENADES, PRACTICE, hand or rifle	1	1.2G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0373	SIGNAL DEVICES, HAND	1	1.4S		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0374	SOUNDING DEVICES, EXPLOSIVE	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0375	SOUNDING DEVICES, EXPLOSIVE	1	1.2D		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0376	PRIMERS, TUBULAR	1	1.4S		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0377	PRIMERS, CAP TYPE	1	1.1B		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.4B	2.1.1.3 (4)	5.2.2 (5) 1,4	3.3 (6)	3.4.6 (7a) LQ0 E0	3.2.1 (8)	8.1.5 (9) PP	7.1.6 (10)	7.1.6 (11) LO01 HA01, HA02, HA03, HA04, HA05, HA06	7.1.5 (12)	3.2.1 (13)
0378	PRIMERS, CAP TYPE	1	1.4B		1,4		E0		PP			1	
0379	CASES, CARTRIDGE, EMPTY, WITH PRIMER	1	1.4C		1,4		E0		PP			1	
0380	ARTICLES, PYROPHORIC	1	1.2L		1		E0		PP			3	
0381	CARTRIDGES, POWER DEVICE	1	1.2C		1		E0		PP			3	
3820	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1	1.2B		1	178 274	E0		PP			3	
0383	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1	1.4B		1,4	178 274	E0		PP			1	
0384	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1	1.4S		1,4	178 274	E0		PP			0	
0385	5-NITROBENZOTRIAZOL	1	1.1D		1		E0		PP			3	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
0386	TRINITROBENZENESULPHONIC ACID	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0387	TRINITROFLUORENONE	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0388	TRINITROTOLUENE (TNT) AND TRINITROBENZENE MIXTURE or TRINITROTOLUENE (TNT) AND HEXANITROSTILBENE MIXTURE	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0389	TRINITROTOLUENE (TNT) MIXTURE CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0390	TRITONAL	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0391	CYCLOTRIMETHYLENETRINITRAMINE (CYCLONITE; HEXOGEN; RDX) AND CYCLOTETRAMETHYLENETETRANITRAMINE (HMX; OCTOGEN) MIXTURE, WETTED with not less than 15% water, by mass or DESENSITIZED with not less than 10% phlegmatizer by mass	1	1.1D		1	266	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0392	HEXANITROSTILBENE	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0393	HEXOTONAL	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0394	TRINITRORESORCINOL (STYPHNIC ACID), WETTED with not less than 20% water, or mixture of alcohol and water, by mass	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0395	ROCKET MOTORS, LIQUID FUELLED	1	1.2J		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0396	ROCKET MOTORS, LIQUID FUELLED	1	1.3J		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0397	ROCKETS, LIQUID FUELLED with bursting charge	1	1.1J		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0398	ROCKETS, LIQUID FUELLED with bursting charge	1	1.2J		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0399	BOMBS WITH FLAMMABLE LIQUID with bursting charge	1	1.1J		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0400	BOMBS WITH FLAMMABLE LIQUID with bursting charge	1	1.2J		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
0401	DIPICRYL SULPHIDE; dry or wetted with less than 10% water; by mass	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0402	AMMONIUM PERCHLORATE	1	1.1D		1	152	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0403	FLARES, AERIAL	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0404	FLARES, AERIAL	1	1.4S		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0405	CARTRIDGES, SIGNAL	1	1.4S		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0406	DINITROBENZENE	1	1.3C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0407	TETRAZOL-1-ACETIC ACID	1	1.4C		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0408	FUZES, DETONATING with protective features	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
0409	FUZES, DETONATING with protective features	1	1.2D		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0410	FUZES, DETONATING with protective features	1	1.4D		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0411	PENTAERYTHRITETETRANITRATE (PENTERYTHRITOL TETRANITRATE; PETN) with not less than 7% wax, by mass	1	1.1D		1	131	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0412	CARTRIDGES FOR WEAPONS with bursting charge	1	1.4E		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0413	CARTRIDGES FOR WEAPONS, BLANK	1	1.2C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0414	CHARGES, PROPELLING, FOR CANNON	1	1.2C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0415	CHARGES, PROPELLING	1	1.2C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0417	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1	1.3C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a) 3.4.6 (7b) 3.5.1.2	(8) 3.2.1	(9) 8.1.5	(10) 7.1.6	(11) 7.1.6	(12) 7.1.5	(13) 3.2.1
0418	FLARES, SURFACE	1	1.1G		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0419	FLARES, SURFACE	1	1.2G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0420	FLARES, AERIAL	1	1.1G		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0421	FLARES, AERIAL	1	1.2G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0424	PROJECTILES, inert with tracer	1	1.3G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0425	PROJECTILES, inert with tracer	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0426	PROJECTILES with burster or expelling charge	1	1.2F		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0427	PROJECTILES with burster or expelling charge	1	1.4F		1,4		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	1	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0428	ARTICLES, PYROTECHNIC for technical purposes	1	1.1G		1		LQ0 E0	3.2.1	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0429	ARTICLES, PYROTECHNIC for technical purposes	1	1.2G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0430	ARTICLES, PYROTECHNIC for technical purposes	1	1.3G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0431	ARTICLES, PYROTECHNIC for technical purposes	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0432	ARTICLES, PYROTECHNIC for technical purposes	1	1.4S		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0433	POWDER CAKE (POWDER PASTE), WETTED with not less than 17% alcohol, by mass	1	1.1C		1	266	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0434	PROJECTILES with burster or expelling charge	1	1.2G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0435	PROJECTILES with burster or expelling charge	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0436	ROCKETS with expelling charge	1	1.2C		1		LQ0 E0	3.2.1	PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0437	ROCKETS with expelling charge	1	1.3C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0438	ROCKETS with expelling charge	1	1.4C		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0439	CHARGES, SHAPED, without detonator	1	1.2D		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0440	CHARGES, SHAPED, without detonator	1	1.4D		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0441	CHARGES, SHAPED, without detonator	1	1.4S		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0442	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0443	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1	1.2D		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0444	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1	1.4D		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.4S	2.1.1.3 (4)	5.2.2 (5) 1,4	3.3 (6)	3.4.6 (7a) LQ0 E0	3.2.1 (8)	8.1.5 (9) PP	7.1.6 (10)	7.1.6 (11) LO01 HA01, HA03, HA04, HA05, HA06	7.1.5 (12)	3.2.1 (13)
0445	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1	1.4S		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0446	CASES, COMBUSTIBLE, EMPTY, WITHOUT PRIMER	1	1.4C		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0447	CASES, COMBUSTIBLE, EMPTY, WITHOUT PRIMER	1	1.3C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0448	5-MERCAPTOTETRAZOL-1-ACETIC ACID	1	1.4C		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0449	TORPEDOES, LIQUID FUELLED with or without bursting charge	1	1.1J		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0450	TORPEDOES, LIQUID FUELLED with inert head	1	1.3J		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0451	TORPEDOES with bursting charge	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0452	GRENADES, PRACTICE, hand or rifle	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0453	ROCKETS, LINE-THROWING	1	1.4G	2.1.1.3	5.2.2	3.3	3.4.6	3.2.1	PP		LO01, HA03, HA04, HA05, HA06	1	
0454	IGNITERS	1	1.4S		1,4		LQ0	E0	PP		LO01, HA01, HA03, HA04, HA05, HA06	0	
0455	DETONATORS, NON-ELECTRIC for blasting	1	1.4S		1,4		LQ0	E0	PP		LO01, HA01, HA03, HA04, HA05, HA06	0	
0456	DETONATORS, ELECTRIC for blasting	1	1.4S		1,4		LQ0	E0	PP		LO01, HA01, HA03, HA04, HA05, HA06	0	
0457	CHARGES, BURSTING, PLASTICS BONDED	1	1.1D		1		LQ0	E0	PP		LO01, HA01, HA02, HA03, HA04, HA05, HA06	3	
0458	CHARGES, BURSTING, PLASTICS BONDED	1	1.2D		1		LQ0	E0	PP		LO01, HA01, HA03, HA04, HA05, HA06	3	
0459	CHARGES, BURSTING, PLASTICS BONDED	1	1.4D		1,4		LQ0	E0	PP		LO01, HA01, HA03, HA04, HA05, HA06	1	
0460	CHARGES, BURSTING, PLASTICS BONDED	1	1.4S		1,4		LQ0	E0	PP		LO01, HA01, HA03, HA04, HA05, HA06	0	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a) 3.4.6 3.5.1.2 (7b)	(8)	(9)	(10)	(11)	(12)	(13)
0461	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1	1.1B		1	178 274	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0462	ARTICLES, EXPLOSIVE, N.O.S.	1	1.1C		1	178 274	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0463	ARTICLES, EXPLOSIVE, N.O.S.	1	1.1D		1	178 274	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0464	ARTICLES, EXPLOSIVE, N.O.S.	1	1.1E		1	178 274	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0465	ARTICLES, EXPLOSIVE, N.O.S.	1	1.1F		1	178 274	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0466	ARTICLES, EXPLOSIVE, N.O.S.	1	1.2C		1	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0467	ARTICLES, EXPLOSIVE, N.O.S.	1	1.2D		1	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0468	ARTICLES, EXPLOSIVE, N.O.S.	1	1.2E		1	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0469	3.1.2 ARTICLES, EXPLOSIVE, N.O.S.	1	1.2F		1	178 274	LQ0 E0	3.2.1	PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0470	ARTICLES, EXPLOSIVE, N.O.S.	1	1.3C		1	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0471	ARTICLES, EXPLOSIVE, N.O.S.	1	1.4E		1,4	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0472	ARTICLES, EXPLOSIVE, N.O.S.	1	1.4F		1,4	178 274	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	1	
0473	SUBSTANCES, EXPLOSIVE, N.O.S.	1	1.1A		1	178 274	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0474	SUBSTANCES, EXPLOSIVE, N.O.S.	1	1.1C		1	178 274	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0475	SUBSTANCES, EXPLOSIVE, N.O.S.	1	1.1D		1	178 274	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0476	SUBSTANCES, EXPLOSIVE, N.O.S.	1	1.1G		1	178 274	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a) (7b)	(8)	(9)	(10)	(11)	(12)	(13)
0477	3.1.2 (2) SUBSTANCES, EXPLOSIVE, N.O.S.	1	1.3C		1	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0478	SUBSTANCES, EXPLOSIVE, N.O.S.	1	1.3G		1	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0479	SUBSTANCES, EXPLOSIVE, N.O.S.	1	1.4C		1,4	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0480	SUBSTANCES, EXPLOSIVE, N.O.S.	1	1.4D		1,4	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0481	SUBSTANCES, EXPLOSIVE, N.O.S.	1	1.4S		1,4	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0482	SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE (SUBSTANCES, EVD), N.O.S.	1	1.5D		1,5	178 274	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0483	CYCLOTRIMETHYLENETRINITRAMINE (CYCLONITE; HEXOGEN; RDX), DESENSITIZED	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0484	CYCLOTETRAMETHYLENE- TETRAMITRAMINE (HMX; OCTOGEN), DESENSITIZED	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.4G	2.1.1.3 (4)	5.2.2 (5) 1,4	3.3 (6) 178 274	3.4.6 (7a) LQ0 E0	3.2.1 (8)	8.1.5 (9) PP	7.1.6 (10)	7.1.6 (11) LO01 HA01, HA03, HA04, HA05, HA06	7.1.5 (12)	3.2.1 (13)
0485	SUBSTANCES, EXPLOSIVE, N.O.S.	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0486	ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE (ARTICLES, EEI)	1	1.6N		1,6		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0487	SIGNALS, SMOKE	1	1.3G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0488	AMMUNITION, PRACTICE	1	1.3G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0489	DINITROGLYCOLURIL (DINGU)	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0490	NITROTRIAZOLONE (NTO)	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0491	CHARGES, PROPELLING	1	1.4C		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0492	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1	1.3G		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
0493	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1	1.4G	2.1.1.3	1,4		LQ0 E0	3.2.1	PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0494	JET PERFORATING GUNS, CHARGED, oil well, without detonator	1	1.4D		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0495	PROPELLANT, LIQUID	1	1.3C		1	224	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0496	OCTONAL	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0497	PROPELLANT, LIQUID	1	1.1C		1	224	LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0498	PROPELLANT, SOLID	1	1.1C		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0499	PROPELLANT, SOLID	1	1.3C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0500	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	1	1.4S		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 1.4C	2.1.1.3 (4)	5.2.2 (5) 1,4	3.3 (6)	3.4.6 (7a) LQ0 E0	3.2.1 (8)	8.1.5 (9) PP	7.1.6 (10)	7.1.6 (11) LO01 HA01, HA03, HA04, HA05, HA06	7.1.5 (12)	3.2.1 (13)
0501	PROPELLANT, SOLID	1	1.4C						PP			1	
0502	ROCKETS with inert head	1	1.2C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
0503	AIR BAG INFLATORS or AIR BAG MODULES or SEAT-BELT PRETENSIONERS	1	1.4G		1,4	235 289	LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0504	IH-TETRAZOLE	1	1.1D		1		LQ0 E0		PP		LO01 HA01, HA02, HA03, HA04, HA05, HA06	3	
0505	SIGNALS, DISTRESS, ship	1	1.4G		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	1	
0506	SIGNALS, DISTRESS, ship	1	1.4S		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0507	SIGNALS, SMOKE	1	1.4S		1,4		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	0	
0508	1-HYDROXY-BENZOTRIAZOLE, ANHYDROUS, dry or wetted with less than 20% water, by mass	1	1.3C		1		LQ0 E0		PP		LO01 HA01, HA03, HA04, HA05, HA06	3	
1001	ACETYLENE, DISSOLVED	2	4F		2.1		LQ0 E0		PP, EX, A	VE01		1	
1002	AIR, COMPRESSED	2	1A		2.2	292	LQ1 E1		PP			0	
1003	AIR, REFRIGERATED LIQUID	2	30		2.2+5.1		LQ0 E0		PP			0	
1005	AMMONIA, ANHYDROUS	2	2TC		2.3+8	23	LQ0 E0	T	PP, EP, TOX, A	VE02		2	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loadings, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	(3a)	(3b)	2.1.1.3 (4)	5.2.2 (5)	(6)	3.4.6 (7a) 3.5.1.2 (7b)	(8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1006	ARGON, COMPRESSED	2	1A		2.2		LQ1 E1		PP			0	
1008	BORON TRIFLUORIDE	2	2TC		2.3+8		LQ0 E0		PP, EP, TOX, A	VE02		2	
1009	BROMOTRIFLUOROMETHANE (REFRIGERANT GAS R 13B1)	2	2A		2,2		LQ1 E1		PP			0	
1010	BUTADIENES, STABILIZED or BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED, having a vapour pressure at 70 °C not exceeding 1.1 MPa (11 bar) and a density at 50 °C not lower than 0.525 kg/l	2	2F		2,1	618	LQ0 E0	T	PP, EX, A	VE01		1	
1011	BUTANE	2	2F		2,1		LQ0 E0	T	PP, EX, A	VE01		1	
1012	BUTYLENES MIXTURE or 1-BUTYLENE or CIS-2-BUTYLENE or TRANS-2-BUTYLENE	2	2F		2,1		LQ0 E0	T	PP, EX, A	VE01		1	
1013	CARBON DIOXIDE	2	2A		2,2	584 653	LQ1 E1		PP			0	
1016	CARBON MONOXIDE, COMPRESSED	2	1TF		2.3+2.1		LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
1017	CHLORINE	2	2TOC		2.3+5.1+8		LQ0 E0		PP, EP, TOX, A	VE02		2	
1018	CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)	2	2A		2,2		LQ1 E1		PP			0	
1020	CHLOROPENTAFLUOROETHANE (REFRIGERANT GAS R 115)	2	2A		2,2		LQ1 E1	T	PP			0	
1021	1-CHLORO-1,2,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 124)	2	2A		2,2		LQ1 E1		PP			0	
1022	CHLOROTRIFLUOROMETHANE (REFRIGERANT GAS R 13)	2	2A		2,2		LQ1 E1		PP			0	
1023	COAL GAS, COMPRESSED	2	1TF		2.3+2.1		LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
1026	CYANOGEN	2	2TF		2.3+2.1		LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
1027	CYCLOPROPANE	2	2F		2,1		LQ0 E0		PP, EX, A	VE01		1	
1028	DICHLORODIFLUOROMETHANE (REFRIGERANT GAS R 12)	2	2A		2,2		LQ1 E1		PP			0	
1029	DICHLOROFUOROMETHANE (REFRIGERANT GAS R 21)	2	2A		2,2		LQ1 E1		PP			0	
1030	1,1-DIFLUOROETHANE (REFRIGERANT GAS R 152a)	2	2F		2,1		LQ0 E0	T	PP, EX, A	VE01		1	
1032	DIMETHYLAMINE, ANHYDROUS	2	2F		2,1		LQ0 E0		PP, EX, A	VE01		1	
1033	DIMETHYL ETHER	2	2F		2,1		LQ0 E0	T	PP, EX, A	VE01		1	
1035	ETHANE	2	2F		2,1		LQ0 E0		PP, EX, A	VE01		1	
1036	ETHYLAMINE	2	2F		2,1		LQ0 E0		PP, EX, A	VE01		1	
1037	ETHYL CHLORIDE	2	2F		2,1		LQ0 E0		PP, EX, A	VE01		1	
1038	ETHYLENE, REFRIGERATED LIQUID	2	3F		2,1		LQ0 E0		PP, EX, A	VE01		1	
1039	ETHYL METHYL ETHER	2	2F		2,1		LQ0 E0		PP, EX, A	VE01		1	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1040	ETHYLENE OXIDE	2	2TF		2.3+2.1		LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
1040	ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1 MPa (10 bar) at 50 °C	2	2TF		2.3+2.1		LQ0 E0	T	PP, EP, EX, TOX, A	VE01, VE02		2	
1041	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 9% but not more than 87% ethylene oxide	2	2F		2,1		LQ0 E0		PP, EP, EX, TOX, A	VE01		1	
1043	FERTILIZER AMMONIATING SOLUTION with free ammonia	2	4A		2,2		LQ1 E0		PP			0	
1044	FIRE EXTINGUISHERS with compressed or liquefied gas	2	6A		2,2	225 594	LQ0 E0		PP			0	
1045	FLUORINE, COMPRESSED	2	1TOC		2.3+5.1+8		LQ0 E0		PP, EP, TOX, A	VE02		2	
1046	HELIUM, COMPRESSED	2	1A		2,2		LQ1 E1		PP			0	
1048	HYDROGEN BROMIDE, ANHYDROUS	2	2TC		2.3+8		LQ0 E0		PP, EP, TOX, A	VE02		2	
1049	HYDROGEN, COMPRESSED	2	1F		2,1		LQ0 E0		PP, EX, A	VE01		1	
1050	HYDROGEN CHLORIDE, ANHYDROUS	2	2TC		2.3+8		LQ0 E0		PP, EP, TOX, A	VE02		2	
1051	HYDROGEN CYANIDE, STABILIZED containing less than 3% water	6,1	TF1	1	6.1+3	603 802	LQ0 E5		PP, EP, EX, TOX, A	VE01, VE02		2	
1052	HYDROGEN FLUORIDE, ANHYDROUS	8	CT1	1	8+6.1	802	LQ0 E0		PP, EP, TOX, A	VE02		2	
1053	HYDROGEN SULPHIDE	2	2TF		2.3+2.1		LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
1055	ISOBUTYLENE	2	2F		2,1		LQ0 E0		PP, EX, A	VE01		1	
1056	KRYPTON, COMPRESSED	2	1A		2,2		LQ1 E1	T	PP, EX, A	VE01		0	
1057	LIGHTERS or LIGHTER REFILLS containing flammable gas	2	6F		2,1	201 654	LQ0 E0		PP, EX, A	VE01		1	
1058	LIQUEFIED GASES, non-flammable, charged with nitrogen, carbon dioxide or air	2	2A		2,2		LQ1 E1		PP			0	
1060	METHYLACETYLENE AND PROPADIENE MIXTURE, STABILIZED such as mixture P1 or mixture P2	2	2F		2,1	581	LQ0 E0		PP, EX, A	VE01		1	
1061	METHYLAMINE, ANHYDROUS	2	2F		2,1		LQ0 E0		PP, EX, A	VE01		1	
1062	METHYL BROMIDE with not more than 2% chloropicrin	2	2I		2,3	23	LQ0 E0		PP, EP, TOX, A	VE02		2	
1063	METHYL CHLORIDE (REFRIGERANT GAS R 40)	2	2F		2,1		LQ0 E0	T	PP, EX, A	VE01		1	
1064	METHYL MERCAPTAN	2	2TF		2.3+2.1		LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
1065	NEON, COMPRESSED	2	1A		2,2		LQ1 E1		PP			0	
1066	NITROGEN, COMPRESSED	2	1A		2,2		LQ1 E1		PP			0	
1067	DINITROGEN TETROXIDE (NITROGEN DIOXIDE)	2	2TOC		2.3+5.1+8		LQ0 E0		PP, EP, TOX, A	VE02		2	

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(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a) 3.4.6 3.5.1.2 (7b)	(8)	(9)	(10)	(11)	(12)	(13)
1069	NITROSYL CHLORIDE	2	2TC	2.1.1.3	2.3+8		LQ0 E0		PP, EP, TOX, A	VE02		2	3.2.1 (13)
1070	NITROUS OXIDE	2	2O		2.2+5.1	584	LQ0 E0		PP			0	
1071	OIL GAS, COMPRESSED	2	1TF		2.3+2.1		LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
1072	OXYGEN, COMPRESSED	2	1O		2.2+5.1		LQ0 E0		PP			0	
1073	OXYGEN, REFRIGERATED LIQUID	2	3O		2.2+5.1		LQ0 E0		PP			0	
1075	PETROLEUM GASES, LIQUEFIED	2	2F		2.1	274 583 639	LQ0 E0		PP, EX, A	VE01		1	
1076	PHOSGENE	2	2TC		2.3+8		LQ0 E0		PP, EP, TOX, A	VE02		2	
1077	PROPYLENE	2	2F		2.1		LQ0 E0	T	PP, EX, A	VE01		1	
1078	REFRIGERANT GAS, N.O.S., such as mixture F1, mixture F2 or mixture F3	2	2A		2.2	274 582	LQ1 E1		PP			0	
1079	SULPHUR DIOXIDE	2	2TC		2.3+8		LQ0 E0		PP, EP, TOX, A	VE02		2	
1080	SULPHUR HEXAFLUORIDE	2	2A		2.2		LQ1 E1		PP			0	
1081	TETRAFLUOROETHYLENE, STABILIZED	2	2F		2.1		LQ0 E0		PP, EX, A	VE01		1	
1082	TRIFLUOROCHLOROETHYLENE, STABILIZED	2	2TF		2.3+2.1		LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
1083	TRIMETHYLAMINE, ANHYDROUS	2	2F		2.1		LQ0 E0	T	PP, EX, A	VE01		1	
1085	VINYL BROMIDE, STABILIZED	2	2F		2.1		LQ0 E0		PP, EX, A	VE01		1	
1086	VINYL CHLORIDE, STABILIZED	2	2F		2.1		LQ0 E0	T	PP, EX, A	VE01		1	
1087	VINYL METHYL ETHER, STABILIZED	2	2F		2.1		LQ0 E0		PP, EX, A	VE01		1	
1088	ACETAL	3	F1	II	3		LQ4 E2	T	PP, EX, A	VE01		1	
1089	ACETALDEHYDE	3	F1	I	3		LQ3 E3	T	PP, EX, A	VE01		1	
1090	ACETONE	3	F1	II	3		LQ4 E2	T	PP, EX, A	VE01		1	
1091	ACETONE OILS	3	F1	II	3		LQ4 E2	T	PP, EX, A	VE01		1	
1092	ACROLEIN, STABILIZED	6,1	TF1	I	6.1+3	802	LQ0 E5	T	PP, EP, EX, TOX, A	VE01, VE02		2	
1093	ACRYLONITRILE, STABILIZED	3	FT1	I	3+6.1	802	LQ0 E0	T	PP, EP, EX, TOX, A	VE01, VE02		2	
1098	ALLYL ALCOHOL	6,1	TF1	I	6.1+3	802	LQ0 E5	T	PP, EP, EX, TOX, A	VE01, VE02		2	
1099	ALLYL BROMIDE	3	FT1	I	3+6.1	802	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
1100	ALLYL CHLORIDE	3	FT1	I	3+6.1	802	LQ0 E0	T	PP, EP, EX, TOX, A	VE01, VE02		2	
1104	AMYL ACETATES	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
1105	PENTANOLS	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
1105	PENTANOLS	3	F1	III	3		LQ7 E1	T	PP, EX, A	VE01		0	
1106	AMYLAMINE	3	FC	II	3+8		LQ4 E2	T	PP, EP, EX, A	VE01		1	
1106	AMYLAMINE	3	FC	III	3+8		LQ7 E1		PP, EP, EX, A	VE01		0	
1107	AMYL CHLORIDE	3	F1	II	3		LQ4 E2	T	PP, EX, A	VE01		1	
1108	1-PENTENE (n-AMYLENE)	3	F1	I	3		LQ3 E3	T	PP, EX, A	VE01		1	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1109	AMYL FORMATES	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1110	n-AMYL METHYL KETONE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1111	AMYL MERCAPTAN	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1112	AMYL NITRATE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1113	AMYL NITRITE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1114	BENZENE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1120	BUTANOLS	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1120	BUTANOLS	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1123	BUTYL ACETATES	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1123	BUTYL ACETATES	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1125	n-BUTYLAMINE	3	FC	II	3+8		LQ4	E2	PP, EP, EX, A	VE01		1	
1126	1-BROMOBUTANE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1127	CHI OROBUTANES	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1128	n-BUTYL FORMATE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1129	BUTYRALDEHYDE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1130	CAMPHOR OIL	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1131	CARBON DISULPHIDE	3	FT1	I	3+6.1	802	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
1133	ADHESIVES containing flammable liquid	3	F1	I	3		LQ3	E3	PP, EX, A	VE01		1	
1133	ADHESIVES containing flammable liquid (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	640C	LQ6	E2	PP, EX, A	VE01		1	
1133	ADHESIVES containing flammable liquid (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	640D	LQ6	E2	PP, EX, A	VE01		1	
1133	ADHESIVES containing flammable liquid	3	F1	III	3	640E	LQ7	E1	PP, EX, A	VE01		0	
1133	ADHESIVES containing flammable liquid (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C more than 110 kPa, boiling point not more than 35° C)	3	F1	III	3	640F	LQ7	E1	PP, EX, A	VE01		0	
1133	ADHESIVES containing flammable liquid (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C more than 110 kPa, boiling point of more than 35° C)	3	F1	III	3	640G	LQ7	E1	PP, EX, A	VE01		0	
1133	ADHESIVES containing flammable liquid (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3	640H	LQ7	E1	PP, EX, A	VE01		0	
1134	CHLOROBENZENE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1135	ETHYLENE CHLOROXYDRIN	6.1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
1136	COAL TAR DISTILLATES, FLAMMABL	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1136	COAL TAR DISTILLATES, FLAMMABL	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
1139	3.1.2 (2) COATING SOLUTION (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining)	3	F1	I	3		LQ3	E3	PP, EX, A	VE01		1	
1139	COATING SOLUTION (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining) (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	640C	LQ6	E2	PP, EX, A	VE01		1	
1139	COATING SOLUTION (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	640D	LQ6	E2	PP, EX, A	VE01		1	
1139	COATING SOLUTION (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining)	3	F1	III	3	640E	LQ7	E1	PP, EX, A	VE01		0	
1139	COATING SOLUTION (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining) (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (boiling point not more than 35 °C)	3	F1	III	3	640F	LQ7	E1	PP, EX, A	VE01		0	
1139	COATING SOLUTION (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining) (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C, boiling point of more than 35 °C)	3	F1	III	3	640G	LQ7	E1	PP, EX, A	VE01		0	
1139	COATING SOLUTION (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining) (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3	640H	LQ7	E1	PP, EX, A	VE01		0	
1143	CROTONALDEHYDE or CROTONALDEHYDE, STABILIZED	6,1	TF1	I	6.1+3	324 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
1144	CROTONYLENE	3	F1	I	3		LQ3	E3	PP, EX, A	VE01		1	
1145	CYCLOHEXANE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1146	CYCLOPENTANE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1147	DECAHYDRO-NAPHTHALENE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1148	DIACETONE ALCOHOL	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1148	DIACETONE ALCOHOL	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1149	DIETHYL ETHERS	3	F1	III	3		LQ7		PP, EX, A	VE01		0	
1150	1,2-DICHLOROETHYLENE	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1152	DICHLOROPENTANES	3	F1	III	3		LQ7		PP, EX, A	VE01		0	
1153	ETHYLENE GLYCOL DIETHYL ETHER	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1153	ETHYLENE GLYCOL DIETHYL ETHER	3	F1	III	3		LQ7		PP, EX, A	VE01		0	
1154	DIETHYLAMINE	3	FC	II	3+8		LQ4	T	PP, EP, EX, A	VE01		1	
1155	DIETHYL ETHER (ETHYL ETHER)	3	F1	I	3		LQ3	T	PP, EX, A	VE01		1	
1156	DIETHYL KETONE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
1157	DIISOBUTYL KETONE	3	F1	III	3		LQ7	T	PP, EX, A	VE01		0	
1158	DIISOPROPYLAMINE	3	FC	II	3+8		LQ4		PP, EP, EX, A	VE01		1	
1159	DIISOPROPYL ETHER	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1160	DIETHYLAMINE AQUEOUS SOLUTION	3	FC	II	3+8		LQ4	T	PP, EP, EX, A	VE01		1	
1161	DIMETHYL CARBONATE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
1162	DIMETHYLDICHLOROSILANI	3	FC	II	3+8		LQ4		PP, EP, EX, A	VE01		1	
1163	DIMETHYLHYDRAZINE, UNSYMMETRICAL	6,1	TFC	I	6.1+3+8	802	LQ0	T	PP, EP, EX, TOX, A	VE01, VE02		2	
1164	DIMETHYL SULPHIDE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
1165	DIOXANE	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1166	DIOXOLANE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
1167	DIVINYL ETHER, STABILIZED	3	F1	I	3		LQ3	T	PP, EX, A	VE01		1	
1169	EXTRACTS, AROMATIC, LIQUID	3	F1	I	3		LQ3		PP, EX, A	VE01		1	
1169	EXTRACTS, AROMATIC, LIQUID (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	601 640C	LQ6		PP, EX, A	VE01		1	
1169	EXTRACTS, AROMATIC, LIQUID (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	601 640D	LQ6		PP, EX, A	VE01		1	
1169	EXTRACTS, AROMATIC, LIQUID	3	F1	III	3	601 640E	LQ7		PP, EX, A	VE01		0	
1169	EXTRACTS, AROMATIC, LIQUID (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (boiling point not more than 35° C)	3	F1	III	3	601 640F	LQ7		PP, EX, A	VE01		0	
1169	EXTRACTS, AROMATIC, LIQUID (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3	601 640G	LQ7		PP, EX, A	VE01		0	
1169	EXTRACTS, AROMATIC, LIQUID (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3	601 640H	LQ7		PP, EX, A	VE01		0	
1170	ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	3	F1	II	3	144 601	LQ4	T	PP, EX, A	VE01		1	
1170	ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	3	F1	III	3	144 601	LQ7	T	PP, EX, A	VE01		0	
1171	ETHYLENE GLYCOL MONOETHYL ETHER	3	F1	III	3		LQ7	T	PP, EX, A	VE01		0	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/ lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1172	ETHYLENE GLYCOL MONOETHYL ETHER ACETATE	3	F1	III	3		LQ7	E1	T	VE01		0	
1173	ETHYL ACETATE	3	F1	II	3		LQ4	E2	T	VE01		1	
1175	ETHYLBENZENE	3	F1	II	3		LQ4	E2	T	VE01		1	
1176	ETHYL BORATE	3	F1	II	3		LQ4	E2	T	VE01		1	
1177	2-ETHYLBUTYL ACETATE	3	F1	III	3		LQ7	E1	T	VE01		0	
1178	2-ETHYLBUTYRALDEHYDE	3	F1	II	3		LQ4	E2	T	VE01		1	
1179	ETHYL BUTYL ETHER	3	F1	II	3		LQ4	E2	T	VE01		1	
1180	ETHYL BUTYRATE	3	F1	III	3		LQ7	E1	T	VE01		0	
1181	ETHYL CHLOROACETATE	6,1	TF1	II	6.1+3	802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
1182	ETHYL CHLOROFORMATE	6,1	TFC	I	6.1+3+8	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
1183	ETHYLDICHLOROSILANE	4,3	WFC	I	4.3+3+8		LQ0	E0	PP, EP, EX, A	VE01	HA08	1	
1184	ETHYLENE DICHLORIDE	3	FT1	II	3+6.1	802	LQ0	E2	PP, EP, EX, TOX, A	VE01, VE02		2	
1185	ETHYLENEIMINE, STABILIZED	6,1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
1188	ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE	3	F1	III	3		LQ7	E1	T	VE01		0	
1189	ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE	3	F1	III	3		LQ7	E1	T	VE01		0	
1190	ETHYL FORMATE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1191	OCTYL ALDEHYDES	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1192	ETHYL LACTATE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1193	ETHYL METHYL KETONE (METHYL ETHYL KETONE)	3	F1	II	3		LQ4	E2	T	VE01		1	
1194	ETHYL NITRITE SOLUTION	3	FT1	I	3+6.1	802	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
1195	ETHYL PROPIONATE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1196	ETHYLTRICHLOROSILANE	3	FC	II	3+8		LQ4	E2	PP, EP, EX, A	VE01		1	
1197	EXTRACTS, FLAVOURING, LIQUID	3	F1	I	3		LQ3	E3	PP, EX, A	VE01		1	
1197	EXTRACTS, FLAVOURING, LIQUID (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	601 640C	LQ6	E2	PP, EX, A	VE01		1	
1197	EXTRACTS, FLAVOURING, LIQUID (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	601 640D	LQ6	E2	PP, EX, A	VE01		1	
1197	EXTRACTS, FLAVOURING, LIQUID	3	F1	III	3	601 640E	LQ7	E1	PP, EX, A	VE01		0	
1197	EXTRACTS, FLAVOURING, LIQUID (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (boiling point not more than 35° C)	3	F1	III	3	601 640F	LQ7	E1	PP, EX, A	VE01		0	
1197	EXTRACTS, FLAVOURING, LIQUID (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C more than 110 kPa, boiling point of more than 35° C)	3	F1	III	3	601 640G	LQ7	E1	PP, EX, A	VE01		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1197	EXTRACTS, FLAVOURING, LIQUID (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3	601 640H	LQ7 E1		PP, EX, A	VE01		0	
1198	FORMALDEHYDE SOLUTION, FLAMMABLE	3	FC	III	3+8		LQ7 E1	T	PP, EP, EX, A	VE01		0	
1199	FURALDEHYDES	6.1	TF1	II	6.1+3	802	LQ0 E4	T	PP, EP, EX, TOX, A	VE01, VE02		2	
1201	FUSEL OIL	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
1201	FUSEL OIL	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
1202	GAS OIL or DIESEL FUEL or HEATING OIL, LIGHT (flash-point not more than 60 °C)	3	F1	III	3	640K	LQ7 E1	T	PP, EX, A	VE01		0	
1202	DIESEL FUEL complying with standard EN 590:2004 or GAS OIL or HEATING OIL, LIGHT with a flash-point as specified in EN 590:2004	3	F1	III	3	640L	LQ7 E1	T	PP, EX, A	VE01		0	
1202	GAS OIL or DIESEL FUEL or HEATING OIL, LIGHT (flash-point more than 60 °C and not more than 100 °C)	3	F1	III	3	640M	LQ7 E1	T	PP, EX, A	VE01		0	
1203	MOTOR SPIRIT or GASOLINE or PETROL	3	F1	II	3	243 534	LQ4 E2	T	PP, EX, A	VE01		1	
1204	NITROGLYCERIN SOLUTION IN ALCOHOL with not more than 1% nitroglycerin	3	D	II	3	601	LQ0 E0		PP, EX, A	VE01		1	
1206	HEPTANES	3	F1	II	3		LQ4 E2	T	PP, EX, A	VE01		1	
1207	HEXALDEHYDE	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
1208	HEXANES	3	F1	II	3		LQ4 E2	T	PP, EX, A	VE01		1	
1210	PRINTING INK, flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable	3	F1	I	3	163	LQ3 E3		PP, EX, A	VE01		1	
1210	PRINTING INK, flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	163 640C	LQ6 E2		PP, EX, A	VE01		1	
1210	PRINTING INK, flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	163 640D	LQ6 E2		PP, EX, A	VE01		1	
1210	PRINTING INK, flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable	3	F1	III	3	163 640E	LQ7 E1		PP, EX, A	VE01		0	
1210	PRINTING INK, flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (boiling point not more than 35 °C)	3	F1	III	3	163 640F	LQ7 E1		PP, EX, A	VE01		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1210	PRINTING INK, flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C more than 110 kPa, boiling point of more than 35° C)	3	F1	III	3	163 640G	LQ7 E1		PP, EX, A	VE01		0	
1210	PRINTING INK, flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3	163 640H	LQ7 E1		PP, EX, A	VE01		0	
1212	ISOBUTANOL (ISOBUTYL ALCOHOL)	3	F1	III	3		LQ7 E1	T	PP, EX, A	VE01		0	
1213	ISOBUTYL ACETATE	3	F1	II	3		LQ4 E2	T	PP, EX, A	VE01		1	
1214	ISOBUTYLAMINE	3	FC	II	3+8		LQ4 E2	T	PP, EP, EX, A	VE01		1	
1216	ISOCETENES	3	F1	II	3		LQ4 E2	T	PP, EX, A	VE01		1	
1218	ISOPRENE, STABILIZED	3	F1	I	3		LQ3 E3	T	PP, EX, A	VE01		1	
1219	ISOPROPANOL (ISOPROPYL ALCOHOL)	3	F1	II	3	601	LQ4 E2	T	PP, EX, A	VE01		1	
1220	ISOPROPYL ACETATE	3	F1	II	3		LQ4 E2	T	PP, EX, A	VE01		1	
1221	ISOPROPYLAMINE	3	FC	I	3+8		LQ3 E0	T	PP, EP, EX, A	VE01		1	
1222	ISOPROPYL NITRATE	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
1223	KEROSENE	3	F1	III	3		LQ7 E1	T	PP, EX, A	VE01		0	
1224	KETONES, LIQUID, N.O.S. (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	274 640C	LQ4 E2	T	PP, EX, A	VE01		1	
1224	KETONES, LIQUID, N.O.S. (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	274 640D	LQ4 E2	T	PP, EX, A	VE01		1	
1224	KETONES, LIQUID, N.O.S.	3	F1	III	3	274	LQ7 E1	T	PP, EX, A	VE01		0	
1228	MERCAPTANS, LIQUID, FLAMMABLE, TOXIC, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, TOXIC, N.O.S.	3	FT1	II	3+6.1	274 802	LQ0 E2		PP, EP, EX, TOX, A	VE01, VE02		2	
1228	MERCAPTANS, LIQUID, FLAMMABLE, TOXIC, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, TOXIC, N.O.S.	3	FT1	III	3+6.1	274 802	LQ7 E1		PP, EP, EX, TOX, A	VE01, VE02		0	
1229	MESITYL OXIDE	3	F1	III	3		LQ7 E1	T	PP, EX, A	VE01		0	
1230	METHANOL	3	FT1	II	3+6.1	279 802	LQ0 E2	T	PP, EP, EX, TOX, A	VE01, VE02		2	
1231	METHYL ACETATE	3	F1	II	3		LQ4 E2	T	PP, EX, A	VE01		1	
1233	METHYLAMYL ACETATE	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
1234	METHYLAL	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
1235	METHYLAMINE, AQUEOUS SOLUTION	3	FC	II	3+8		LQ4 E2	T	PP, EP, EX, A	VE01		1	
1237	METHYL BUTYRATE	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
1238	METHYL CHLOROFORMATE	6.1	TFC	I	6.1+3+8	802	LQ0 E5		PP, EP, EX, TOX, A	VE01, VE02		2	
1239	METHYL CHLOROMETHYL ETHER	6.1	TF1	I	6.1+3	802	LQ0 E5		PP, EP, EX, TOX, A	VE01, VE02		2	

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	3.1.2	2.2	2.2	2.1.1.3	5.2.2	3.3	3.4.6	3.2.1	8.1.5	7.1.6	7.1.6	7.1.5	3.2.1
	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
1242	METHYLDICHLOROSILANE	4.3	WFC	I	4.3+3+8		LQ0		PP, EP, EX, A	VE01	HA08	1	
1243	METHYLFORMATE	3	F1	I	3		LQ3	T	PP, EX, A	VE01		1	
1244	METHYLHYDRAZINE	6.1	TFC	I	6.1+3+8	802	LQ0	T	PP, EP, EX, TOX, A	VE01, VE02		2	
1245	METHYL ISOBUTYL KETONE	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1246	METHYL ISOPROPENYL KETONE, STABILIZED	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
1247	METHYL METHACRYLATE MONOMER, STABILIZED	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1248	METHYL PROPIONATE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
1249	METHYL PROPYL KETONE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
1250	METHYLTRICHLOROSILANE	3	FC	II	3+8		LQ4		PP, EP, EX, A	VE01		1	
1251	METHYL VINYL KETONE, STABILIZED	6.1	TFC	I	6.1+3+8	802	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
1259	NICKEL CARBONYL	6.1	TF1	I	6.1+3	802	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
1261	NITROMETHANE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
1262	OCTANES	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1263	PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning and reducing compound)	3	F1	I	3	163 650	LQ3			VE01		1	
1263	PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning and reducing compound) (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	163 640C 650	LQ6		PP, EX, A	VE01		1	
1263	PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning and reducing compound) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	163 640D 650	LQ6		PP, EX, A	VE01		1	
1263	PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning and reducing compound)	3	F1	III	3	163 640E 650	LQ7		PP, EX, A	VE01		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1263	PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning and reducing compound) (having a flash-point below 23 °C and viscous according to 2.2.3.1 (boiling point not more than 35°C).	3	F1	III	3	163 640G 650	LQ7 E1	E1	PP, EX, A	VE01		0	
1263	PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning and reducing compound) (having a flash-point below 23 °C and viscous according to 2.2.3.1) (vapour pressure at 50 °C more than 110 kPa, boiling point of more than 35°C).	3	F1	III	3	163 640G 650	LQ7 E1	E1	PP, EX, A	VE01		0	
1263	PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning and reducing compound) (having a flash-point below 23 °C and viscous according to 2.2.3.1) (vapour pressure at 50 °C not more than 110 kPa).	3	F1	III	3	163 640H 650	LQ7 E1	E1	PP, EX, A	VE01		0	
1264	PARALDEHYDE	3	F1	III	3		LQ7 E1	E1	PP, EX, A	VE01		0	
1265	PENTANES, liquid	3	F1	I	3		LQ3 E3	E3	PP, EX, A	VE01		1	
1265	PENTANES, liquid	3	F1	II	3		LQ4 E2	E2	PP, EX, A	VE01		1	
1266	PERFUMERY PRODUCTS with flammable solvents	3	F1	I	3		LQ3 E3	E3	PP, EX, A	VE01		1	
1266	PERFUMERY PRODUCTS with flammable solvents (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	640C	LQ6 E2	E2	PP, EX, A	VE01		1	
1266	PERFUMERY PRODUCTS with flammable solvents (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	640D	LQ6 E2	E2	PP, EX, A	VE01		1	
1266	PERFUMERY PRODUCTS with flammable solvents	3	F1	III	3	640E	LQ7 E1	E1	PP, EX, A	VE01		0	
1266	PERFUMERY PRODUCTS with flammable solvents (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (boiling point not more than 35°C)	3	F1	III	3	640F	LQ7 E1	E1	PP, EX, A	VE01		0	
1266	PERFUMERY PRODUCTS with flammable solvents (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C more than 110 kPa, boiling point of more than 35°C)	3	F1	III	3	640G	LQ7 E1	E1	PP, EX, A	VE01		0	

UN No. or ID No.	Name and description	Class	Classi- fication Code	Packing group	Labels	Special provi- sions	Limited and excepted quantities	Carriage permitted	Equipment required	Venti- lation	Provisions concerning loadings, unloading and carriage	Number of blue cones/ lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) LQ7	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1266	PERFUMERY PRODUCTS with flammable solvents (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3	640H	E1		PP, EX, A	VE01		0	
1267	PETROLEUM CRUDE OIL	3	F1	I	3	649	LQ3	T	PP, EX, A	VE01		1	
1267	PETROLEUM CRUDE OIL (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	640C 649	LQ4	T	PP, EX, A	VE01		1	
1267	PETROLEUM CRUDE OIL (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	640D 649	LQ4	T	PP, EX, A	VE01		1	
1267	PETROLEUM CRUDE OIL	3	F1	III	3		LQ7	T	PP, EX, A	VE01		0	
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S.	3	F1	I	3	649	LQ3	T	PP, EX, A	VE01		1	
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	640C 649	LQ4	T	PP, EX, A	VE01		1	
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	640D 649	LQ4	T	PP, EX, A	VE01		1	
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3		LQ7	T	PP, EX, A	VE01		0	
1272	PINE OIL	3	F1	III	3		LQ7		PP, EX, A	VE01		0	
1274	n-PROPANOL (PROPYL ALCOHOL, NORMAL)	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1274	n-PROPANOL (PROPYL ALCOHOL, NORMAL)	3	F1	III	3		LQ7	T	PP, EX, A	VE01		0	
1275	PROPIONALDEHYDE	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1276	n-PROPYL ACETATE	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1277	PROPYLAMINE	3	FC	II	3+8		LQ4	T	PP, EP, EX, A	VE01		1	
1278	1-CHLOROPROPANE	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1279	1,2-DICHLOROPROPANE	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1280	PROPYLENE OXIDE	3	F1	I	3		LQ3	T	PP, EX, A	VE01		1	
1281	PROPYL FORMATES	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1282	PYRIDINE	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
1286	ROSIN OIL	3	F1	I	3		LQ3	T	PP, EX, A	VE01		1	
1286	ROSIN OIL (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	640C	LQ6	T	PP, EX, A	VE01		1	
1286	ROSIN OIL (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	640D	LQ6	T	PP, EX, A	VE01		1	
1286	ROSIN OIL	3	F1	III	3	640E	LQ7	T	PP, EX, A	VE01		0	
1286	ROSIN OIL (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (boiling point not more than 35 °C)	3	F1	III	3	640F	LQ7	T	PP, EX, A	VE01		0	
1286	ROSIN OIL (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C more than 110 kPa, boiling point of more than 35 °C)	3	F1	III	3	640G	LQ7	T	PP, EX, A	VE01		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1286	ROSIN OIL (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3	640H	LQ7 E1		PP, EX, A	VE01		0	
1287	RUBBER SOLUTION	3	F1	I	3		LQ3 E3		PP, EX, A	VE01		1	
1287	RUBBER SOLUTION (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	640C	LQ6 E2		PP, EX, A	VE01		1	
1287	RUBBER SOLUTION (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	640D	LQ6 E2		PP, EX, A	VE01		1	
1287	RUBBER SOLUTION	3	F1	III	3	640E	LQ7 E1		PP, EX, A	VE01		0	
1287	RUBBER SOLUTION (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (boiling point not more than 35 °C)	3	F1	III	3	640F	LQ7 E1		PP, EX, A	VE01		0	
1287	RUBBER SOLUTION (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C more than 110 kPa, boiling point of more than 35 °C)	3	F1	III	3	640G	LQ7 E1		PP, EX, A	VE01		0	
1287	RUBBER SOLUTION (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3	640H	LQ7 E1		PP, EX, A	VE01		0	
1288	SHALE OIL	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
1288	SHALE OIL	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
1289	SODIUM METHYLATE SOLUTION in alcohol	3	FC	II	3+8		LQ4 E2		PP, EP, EX, A	VE01		1	
1289	SODIUM METHYLATE SOLUTION in alcohol	3	FC	III	3+8		LQ7 E1	T	PP, EP, EX, A	VE01		0	
1292	TETRAETHYL SILICATE	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
1293	TINCTURES, MEDICINAL	3	F1	II	3	601	LQ4 E2		PP, EX, A	VE01		1	
1293	TINCTURES, MEDICINAL	3	F1	III	3	601	LQ7 E1		PP, EX, A	VE01		0	
1294	TOLUENE	3	F1	II	3		LQ4 E2	T	PP, EX, A	VE01		1	
1295	TRICHLOROSILANE	4,3	WFC	I	4,3+3+8		LQ0 E0		PP, EP, EX, A	VE01	HA08	1	
1296	TRIMETHYLAMINE	3	FC	II	3+8		LQ4 E2	T	PP, EP, EX, A	VE01		1	
1297	TRIMETHYLAMINE, AQUEOUS SOLUTION, not more than 50% trimethylamine, by mass	3	FC	I	3+8		LQ3 E0		PP, EP, EX, A	VE01		1	
1297	TRIMETHYLAMINE, AQUEOUS SOLUTION, not more than 50% trimethylamine, by mass	3	FC	II	3+8		LQ4 E2		PP, EP, EX, A	VE01		1	
1297	TRIMETHYLAMINE, AQUEOUS SOLUTION, not more than 50% trimethylamine, by mass	3	FC	III	3+8		LQ7 E1		PP, EP, EX, A	VE01		0	
1298	TRIMETHYLCHLOROSILANE	3	FC	II	3+8		LQ4 E2		PP, EP, EX, A	VE01		1	
1299	TURPENTINE	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
1300	TURPENTINE SUBSTITUTE	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
1300	TURPENTINE SUBSTITUTE	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
1301	VINYL ACETATE, STABILIZED	3	F1	III	3		LQ4 E2	T	PP, EX, A	VE01		1	
1302	VINYL ETHER, STABILIZED	3	F1	I	3		LQ3 E3	T	PP, EX, A	VE01		1	
1303	VINYLDIENE CHLORIDE, STABILIZED	3	F1	I	3		LQ3 E3		PP, EX, A	VE01		1	
1304	VINYLI-ISOBUTYL ETHER, STABILIZED	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1305	VINYL-TRICHLOROSILANE, STABILIZED	3	FC	II	3+8		LQ4	E2	PP, EP, EX, A	VE01		1	
1306	WOOD PRESERVATIVES, LIQUID (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	640C	LQ6	E2	PP, EX, A	VE01		1	
1306	WOOD PRESERVATIVES, LIQUID (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	640D	LQ6	E2	PP, EX, A	VE01		1	
1306	WOOD PRESERVATIVES, LIQUID	3	F1	III	3	640E	LQ7	E1	PP, EX, A	VE01		0	
1306	WOOD PRESERVATIVES, LIQUID (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (boiling point not more than 35 °C)	3	F1	III	3	640F	LQ7	E1	PP, EX, A	VE01		0	
1306	WOOD PRESERVATIVES, LIQUID (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C more than 110 kPa, boiling point of more than 35 °C)	3	F1	III	3	640G	LQ7	E1	PP, EX, A	VE01		0	
1306	WOOD PRESERVATIVES, LIQUID (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3	640H	LQ7	E1	PP, EX, A	VE01		0	
1307	XYLENES	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1307	XYLENES	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1308	ZIRCONIUM SUSPENDED IN A FLAMMABLE LIQUID	3	F1	I	3		LQ3	E3	PP, EX, A	VE01		1	
1308	ZIRCONIUM SUSPENDED IN A FLAMMABLE LIQUID (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	640C	LQ4	E2	PP, EX, A	VE01		1	
1308	ZIRCONIUM SUSPENDED IN A FLAMMABLE LIQUID (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	640D	LQ4	E2	PP, EX, A	VE01		1	
1308	ZIRCONIUM SUSPENDED IN A FLAMMABLE LIQUID	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1309	ALUMINIUM POWDER, COATEC	4.1	F3	II	4.1		LQ8	E2	PP			1	
1309	ALUMINIUM POWDER, COATEC	4.1	F3	III	4.1		LQ9	E1	PP			0	
1310	AMMONIUM PICRATE, WETTED with not less than 10% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
1312	BORNEOL	4.1	F1	III	4.1		LQ9	E1	PP			0	
1313	CALCIUM RESINATE	4.1	F3	III	4.1		LQ9	E1	PP			0	
1314	CALCIUM RESINATE, FUSEE	4.1	F3	III	4.1		LQ9	E1	PP			0	
1318	COBALT RESINATE, PRECIPITATED	4.1	F3	III	4.1		LQ9	E1	PP			0	
1320	DINITROPHENOL, WETTED with not less than 15% water, by mass	4.1	DT	I	4.1+6.1	802	LQ0	E0	PP			2	
1321	DINITROPHENOLATES, WETTED with not less than 15% water, by mass	4.1	DT	I	4.1+6.1	802	LQ0	E0	PP			2	
1322	DINITRORESORCINOL, WETTED with not less than 15% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
1323	FERROCERIUM	4.1	F3	II	4.1	249	LQ8	E2	PP			1	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1324	FILMS, NITROCELLULOSE BASE, gelatin coated, except scrap	4.1	F1	III	4.1		LQ9	E1	PP			0	
1325	FLAMMABLE SOLID, ORGANIC, N.O.S	4.1	F1	II	4.1	274	LQ8	E2	PP			1	
1325	FLAMMABLE SOLID, ORGANIC, N.O.S	4.1	F1	III	4.1	274	LQ9	E1	PP			0	
1326	HAFNIUM POWDER, WETTED with not less than 25% water	4.1	F3	II	4.1	586	LQ8	E2	PP			1	
1327	Hay, Straw or Bhusa	4.1	F1										
1328	HEXAMETHYLENETETRAMINE	4.1	F1	III	4.1		LQ9	E1	PP			0	
1330	MANGANESE RESINATE	4.1	F3	III	4.1		LQ9	E1	PP			0	
1331	MATCHES, STRIKE ANYWHERE	4.1	F1	III	4.1	293	LQ9	E1	PP			0	
1332	METALDEHYDE	4.1	F1	III	4.1		LQ9	E1	PP			0	
1333	CERIUM, slabs, ingots or rods	4.1	F3	II	4.1		LQ8	E2	PP			1	
1334	NAPHTHALENE, CRUDE or NAPHTHALENE, REFINED	4.1	F1	III	4.1	501	LQ9	E1	PP		CO01	0	
1336	NITROGUANIDINE (PICRITE), WETTED with not less than 20% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
1337	NITROSTARCH, WETTED with not less than 20% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
1338	PHOSPHORUS, AMORPHOUS	4.1	F3	III	4.1		LQ9	E1	PP			0	
1339	PHOSPHORUS HEPTASULPHIDE, free from yellow and white phosphorus	4.1	F3	II	4.1	602	LQ8	E2	PP			1	
1340	PHOSPHORUS PENTASULPHIDE, free from yellow and white phosphorus	4.3	WF2	II	4.3+4.1	602	LQ11	E2	PP, EX, A	VE01	HA08	1	
1341	PHOSPHORUS SESQUISULPHIDE, free from yellow and white phosphorus	4.1	F3	II	4.1	602	LQ8	E2	PP			1	
1343	PHOSPHORUS TRISULPHIDE, free from yellow and white phosphorus	4.1	F3	II	4.1	602	LQ8	E2	PP			1	
1344	TRINITROPHENOL (PICRIC ACID), WETTED with not less than 30% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
1345	RUBBER SCRAP or RUBBER SHODDY, powdered or granulated	4.1	F1	II	4.1		LQ8	E2	PP			1	
1346	SILICON POWDER, AMORPHOUS	4.1	F3	III	4.1	32	LQ9	E1	PP			0	
1347	SILVER PICRATE, WETTED with not less than 30% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
1348	SODIUM DINITRO-o-CRESOLATE, WETTED with not less than 15% water, by mass	4.1	DT	I	4.1+6.1	802	LQ0	E0	PP			2	
1349	SODIUM PICRAMATE, WETTED with not less than 20% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
1350	SULPHUR	4.1	F3	III	4.1	242	LQ9	E1	PP			0	
1352	TITANIUM POWDER, WETTED with not less than 25% water	4.1	F3	II	4.1	586	LQ8	E2	PP			1	
1353	FIBRES or FABRICS IMPREGNATED WITH WEAKLY NITRATED NITROCELLULOSE, N. O. S.	4.1	F1	III	4.1	274	LQ9	E1	PP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1354	TRINITROBENZENE, WETTED with not less than 30% water, by mass	4.1	D	I	4.1		LQ0 E0		PP			1	
1355	TRINITROBENZOIC ACID, WETTED with not less than 30% water, by mass	4.1	D	I	4.1		LQ0 E0		PP			1	
1356	TRINITROTOLUENE (TNT), WETTED with not less than 30% water, by mass	4.1	D	I	4.1		LQ0 E0		PP			1	
1357	UREA NITRATE, WETTED with not less than 20% water, by mass	4.1	D	I	4.1	227	LQ0 E0		PP			1	
1358	ZIRCONIUM POWDER, WETTED with not less than 25% water	4.1	F3	II	4.1	586	LQ8 E2		PP			1	
1360	CALCIUM PHOSPHIDE	4.3	WT2	I	4.3+6.1	802	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02	HA08	2	
1361	CARBON, animal or vegetable origin	4.2	S2	II	4.2		LQ0 E2		PP			0	
1361	CARBON, animal or vegetable origin	4.2	S2	III	4.2		LQ0 E1		PP			0	
1362	CARBON, ACTIVATED	4.2	S2	III	4.2	646	LQ0 E1		PP			0	
1363	COPRA	4.2	S2	III	4.2		LQ0 E1	B	PP			0	IN01 and IN02 apply only when this substance is carried in bulk or without packaging
1364	COTTON WASTE, OILY	4.2	S2	III	4.2		LQ0 E1	B	PP			0	
1365	COTTON, WET	4.2	S2	III	4.2		LQ0 E1	B	PP			0	
1369	p-NITROSODIMETHYLANILINE	4.2	S2	II	4.2		LQ0 E2		PP			0	
1372	Fibres, animal or fibres, vegetable burnt, wet or damp	4.2	S2										
1373	FIBRES or FABRICS, ANIMAL or VEGETABLE or SYNTHETIC, N.O.S. with oil	4.2	S2	III	4.2	274	LQ0 E1	B	PP			0	
1374	FISH MEAL (FISH SCRAP), UNSTABILIZED	4.2	S2	II	4.2	300	LQ0 E2		PP			0	
1376	IRON OXIDE, SPENT or IRON SPONGE, SPENT obtained from coal gas purification	4.2	S4	III	4.2	592	LQ0 E1	B	PP			0	
1378	METAL CATALYST, WETTED with a visible excess of liquid	4.2	S4	II	4.2	274	LQ0 E2		PP			0	
1379	PAPER, UNSATURATED OIL TREATED, incompletely dried (including carbon paper)	4.2	S2	III	4.2		LQ0 E1	B	PP			0	
1380	PENTABORANE	4.2	ST3	I	4.2+6.1	802	LQ0 E0		PP, EP, TOX, A	VE02		2	
1381	PHOSPHORUS, WHITE or YELLOW, UNDER WATER or IN SOLUTION	4.2	ST3	I	4.2+6.1	503	LQ0 E0		PP, EP, TOX, A	VE02		2	
1381	PHOSPHORUS, WHITE or YELLOW, DRY	4.2	ST4	I	4.2+6.1	503	LQ0 E0		PP, EP			2	
1382	POTASSIUM SULPHIDE, ANHYDROUS or POTASSIUM SULPHIDE with less than 30% water of crystallization	4.2	S4	II	4.2	504	LQ0 E2		PP			0	
1383	PYROPHORIC METAL, N.O.S. or PYROPHORIC ALLOY, N.O.S.	4.2	S4	I	4.2	274	LQ0 E0		PP			0	

NOT SUBJECT TO ADN

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1384	SODIUM DITHIONITE (SODIUM HYDROSULPHITE)	4.2	S4	II	4.2		LQ0 E2		PP			0	
1385	SODIUM SULPHIDE, ANHYDROUS or SODIUM SULPHIDE with less than 30% water of crystallization	4.2	S4	II	4.2	504	LQ0 E2		PP			0	
1386	SEED CAKE with more than 1.5% oil and not more than 11% moisture	4.2	S2	III	4.2	800	LQ0 E1	B	PP		IN01, IN02	0	IN01 and IN02 apply only when this substance is carried in bulk or without packaging
NOT SUBJECT TO ADN													
1387	Wool waste, wet	4.2	S2										
1389	ALKALI METAL AMALGAM, LIQUID	4.3	W1	I	4.3	182 274	LQ0 E0		PP, EX, A	VE01	HA08	0	
1390	ALKALI METAL AMIDES	4.3	W2	II	4.3	182 274 505	LQ11 E2		PP, EX, A	VE01	HA08	0	
1391	ALKALI METAL DISPERSION or ALKALINE EARTH METAL DISPERSION having a flash-point above 60 °C	4.3	W1	I	4.3	182 183 274 506	LQ0 E0		PP, EX, A	VE01	HA08	0	
1391	ALKALI METAL DISPERSION or ALKALINE EARTH METAL DISPERSION having a flash-point of not more than 60 °C	4.3	WF1	I	4.3 3	182 183 274 506	LQ0 E0		PP, EX, A	VE01	HA08	0	
1392	ALKALINE EARTH METAL AMALGAM, LIQUID	4.3	W1	I	4.3	183 274 506	LQ0 E0		PP, EX, A	VE01	HA08	0	
1393	ALKALINE EARTH METAL ALLOY, N.O.S.	4.3	W2	II	4.3	183 274 506	LQ11 E2		PP, EX, A	VE01	HA08	0	
1394	ALUMINIUM CARBIDE	4.3	W2	II	4.3		LQ11 E2		PP, EX, A	VE01	HA08	0	
1395	ALUMINIUM FERROSILICON POWDER	4.3	WT2	II	4.3+6.1	802	LQ11 E2		PP, EP, EX, TOX, A	VE01, VE02	HA08	2	
1396	ALUMINIUM POWDER, UNCOATED	4.3	W2	II	4.3		LQ12 E2		PP, EX, A	VE01	HA08	0	
1396	ALUMINIUM POWDER, UNCOATED	4.3	W2	III	4.3		LQ12 E1		PP, EX, A	VE01	HA08	0	
1397	ALUMINIUM PHOSPHIDE	4.3	WT2	I	4.3+6.1	507 802	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02	HA08	2	
1398	ALUMINIUM SILICON POWDER, UNCOATED	4.3	W2	III	4.3	37	LQ12 E1	B	PP, EX, A	VE01, VE03	LO03, IN01, HA07, HA08, IN03	0	VE03, LO03, HA07, IN01 and IN03 apply only when this substance is carried in bulk or without packaging
1400	BARIUM	4.3	W2	II	4.3		LQ11 E2		PP, EX, A	VE01	HA08	0	
1401	CALCIUM	4.3	W2	II	4.3		LQ11 E2		PP, EX, A	VE01	HA08	0	
1402	CALCIUM CARBIDE	4.3	W2	I	4.3		LQ0 E0		PP, EX, A	VE01	HA08	0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	(6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1402	CALCIUM CARBIDE	4.3	W2	II	4.3		LQ11 E2		PP, EX, A	VE01	HA08	0	
1403	CALCIUM CYANAMIDE with more than 0.1% calcium carbide	4.3	W2	III	4.3	38	LQ12 E1		PP, EX, A	VE01	HA08	0	
1404	CALCIUM HYDRIDE	4.3	W2	I	4.3		LQ0 E0		PP, EX, A	VE01	HA08	0	
1405	CALCIUM SILICIDE	4.3	W2	II	4.3		LQ11 E2		PP, EX, A	VE01	HA08	0	
1405	CALCIUM SILICIDE	4.3	W2	III	4.3		LQ12 E1		PP, EX, A	VE01	HA08	0	
1407	CAESIUM	4.3	W2	I	4.3		LQ0 E0		PP, EX, A	VE01	HA08	0	
1408	FERROSILICON with 30% or more but less than 90% silicon	4.3	WT2	III	4.3+6.1	39 802	LQ12 E1	B	PP, EP, EX, TOX, A	VE01, VE02, VE03	HA07, LO03, HA08, IN01, IN02, IN03	0	VE03, LO03, HA07, IN01, IN02 and IN03 apply only when this substance is carried in bulk or without packaging
1409	METAL HYDRIDES, WATER-REACTIVE, N.O.S.	4.3	W2	I	4.3	274 508	LQ0 E0		PP, EX, A	VE01	HA08	0	
1409	METAL HYDRIDES, WATER-REACTIVE, N.O.S.	4.3	W2	II	4.3	274 508	LQ11 E2		PP, EX, A	VE01	HA08	0	
1410	LITHIUM ALUMINIUM HYDRIDE	4.3	W2	I	4.3		LQ0 E0		PP, EX, A	VE01	HA08	0	
1411	LITHIUM ALUMINIUM HYDRIDE, ETHEREAL	4.3	WF1	I	4.3+3		LQ0 E0		PP, EX, A	VE01	HA08	1	
1413	LITHIUM BOROHYDRIDE	4.3	W2	I	4.3		LQ0 E0		PP, EX, A	VE01	HA08	0	
1414	LITHIUM HYDRIDE	4.3	W2	I	4.3		LQ0 E0		PP, EX, A	VE01	HA08	0	
1415	LITHIUM	4.3	W2	I	4.3		LQ0 E0		PP, EX, A	VE01	HA08	0	
1417	LITHIUM SILICON	4.3	W2	II	4.3		LQ11 E2		PP, EX, A	VE01	HA08	0	
1418	MAGNESIUM POWDER or MAGNESIUM ALLOYS POWDER	4.3	WS	I	4.3+4.2		LQ0 E0		PP, EX, A	VE01	HA08	0	
1418	MAGNESIUM POWDER or MAGNESIUM ALLOYS POWDER	4.3	WS	II	4.3+4.2		LQ11 E2		PP, EX, A	VE01	HA08	0	
1418	MAGNESIUM POWDER or MAGNESIUM ALLOYS POWDER	4.3	WS	III	4.3+4.2		LQ12 E1		PP, EX, A	VE01	HA08	0	
1419	MAGNESIUM ALUMINIUM PHOSPHIDE	4.3	WT2	I	4.3+6.1	802	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02	HA08	2	
1420	POTASSIUM METAL ALLOYS, LIQUID	4.3	W1	I	4.3	182	LQ0 E0		PP, EX, A	VE01	HA08	0	
1421	ALKALI METAL ALLOY, LIQUID, N.O.S.	4.3	W1	I	4.3	274	LQ0 E0		PP, EX, A	VE01	HA08	0	
1422	POTASSIUM SODIUM ALLOYS, LIQUID	4.3	W1	I	4.3		LQ0 E0		PP, EX, A	VE01	HA08	0	
1423	RUBIDIUM	4.3	W2	I	4.3		LQ0 E0		PP, EX, A	VE01	HA08	0	
1426	SODIUM BOROHYDRIDE	4.3	W2	I	4.3		LQ0 E0		PP, EX, A	VE01	HA08	0	
1427	SODIUM HYDRIDE	4.3	W2	I	4.3		LQ0 E0		PP, EX, A	VE01	HA08	0	
1428	SODIUM	4.3	W2	I	4.3		LQ0 E0		PP, EX, A	VE01	HA08	0	
1431	SODIUM METHYLATE	4.2	SC4	II	4.2+8		LQ0 E2		PP			0	
1432	SODIUM PHOSPHIDE	4.3	WT2	I	4.3+6.1	802	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02	HA08	2	
1433	STANNIC PHOSPHIDES	4.3	WT2	I	4.3+6.1	802	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02	HA08	2	

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(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a) 3.4.6 (7b) 3.5.1.2	(8)	(9)	(10)	(11)	(12)	3.2.1 (13)
1435	ZINC ASHES	4.3	W2	III	4.3		LQ12 E1	B	PP, EX, A	VE01, VE03	HA07, HA08, IN01, IN03	0	VE03, LO03, HA07, IN01 and IN03 apply only when this substance is carried in bulk or without packaging
1436	ZINC POWDER or ZINC DUST	4.3	WS	I	4.3+4.2		LQ0 E0		PP, EX, A	VE01	HA08	0	
1436	ZINC POWDER or ZINC DUST	4.3	WS	II	4.3+4.2		LQ11 E2		PP, EX, A	VE01	HA08	0	
1436	ZINC POWDER or ZINC DUST	4.3	WS	III	4.3+4.2		LQ12 E1		PP, EX, A	VE01	HA08	0	
1437	ZIRCONIUM HYDRIDE	4.1	F3	II	4.1		LQ8 E2		PP			1	
1438	ALUMINIUM NITRATE	5.1	O2	III	5.1		LQ12 E1	B	PP		CO02, LO04	0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
1439	AMMONIUM DICHROMATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1442	AMMONIUM PERCHLORATE	5.1	O2	II	5.1	152	LQ11 E2		PP			0	
1444	AMMONIUM PERSULPHATE	5.1	O2	III	5.1		LQ12 E1		PP			0	
1445	BARIUM CHLORATE, SOLJE	5.1	OT2	II	5.1+6.1	802	LQ11 E2		PP			2	
1446	BARIUM NITRATE	5.1	OT2	II	5.1+6.1	802	LQ11 E2		PP			2	
1447	BARIUM PERCHLORATE, SOLJE	5.1	OT2	II	5.1+6.1	802	LQ11 E2		PP			2	
1448	BARIUM PERMANGANATE	5.1	OT2	II	5.1+6.1	802	LQ11 E2		PP			2	
1449	BARIUM PEROXIDE	5.1	OT2	II	5.1+6.1	802	LQ11 E2		PP			2	
1450	IBROMATES, INORGANIC, N.O.S.	5.1	O2	II	5.1	274	LQ11 E2		PP			0	
1451	CAESIUM NITRATE	5.1	O2	III	5.1	604	LQ12 E1	B	PP		CO02, LO04	0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
1452	CALCIUM CHLORATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1453	CALCIUM CHLORITE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1454	CALCIUM NITRATE	5.1	O2	III	5.1	208	LQ12 E1	B	PP		CO02, LO04	0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
1455	CALCIUM PERCHLORATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1456	CALCIUM PERMANGANATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1457	CALCIUM PEROXIDE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1458	CHLORATE AND BORATE MIXTURE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1458	CHLORATE AND BORATE MIXTURE	5.1	O2	III	5.1		LQ12 E1		PP			0	
1459	CHLORATE AND MAGNESIUM CHLORIDE MIXTURE, SOLID	5.1	O2	II	5.1		LQ11 E2		PP			0	
1459	CHLORATE AND MAGNESIUM CHLORIDE MIXTURE, SOLID	5.1	O2	III	5.1		LQ12 E1		PP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
		5.1	O2	II	5.1	274 605	LQ11 E2		PP			0	
1461	CHLORATES, INORGANIC, N.O.S.	5.1	O2	II	5.1	274 509 606	LQ11 E2		PP			0	
1462	CHLORITES, INORGANIC, N.O.S.	5.1	O2	II	5.1	274 509 606	LQ11 E2		PP			0	
1463	CHROMIUM TRIOXIDE, ANHYDROUS	5.1	OTC	II	5.1+6.1+8	510	LQ11 E2		PP			0	
1465	DIDYMIUM NITRATE	5.1	O2	III	5.1	510	LQ12 E1	B	PP		CO02 LO04	0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
1466	FERRIC NITRATE	5.1	O2	III	5.1		LQ12 E1	B	PP		CO02 LO04	0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
1467	GUANIDINE NITRATE	5.1	O2	III	5.1		LQ12 E1	B	PP		CO02 LO04	0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
1469	LEAD NITRATE	5.1	OT2	II	5.1+6.1	802	LQ11 E2		PP			2	
1470	LEAD PERCHLORATE, SOLID	5.1	OT2	II	5.1+6.1	802	LQ11 E2		PP			2	
1471	LITHIUM HYPOCHLORITE, DRY or LITHIUM HYPOCHLORITE MIXTURE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1472	LITHIUM PEROXIDE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1473	MAGNESIUM BROMATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1474	MAGNESIUM NITRATE	5.1	O2	III	5.1	332	LQ12 E1	B	PP		CO02 LO04	0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
1475	MAGNESIUM PERCHLORATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1476	MAGNESIUM PEROXIDE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1477	NITRATES, INORGANIC, N.O.S.	5.1	O2	II	5.1	274 511	LQ11 E2		PP			0	
1477	NITRATES, INORGANIC, N.O.S.	5.1	O2	III	5.1	274 511	LQ12 E1	B	PP		CO02 LO04	0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
1479	OXIDIZING SOLID, N.O.S.	5.1	O2	I	5.1	274	LQ0 E0		PP			0	
1479	OXIDIZING SOLID, N.O.S.	5.1	O2	II	5.1	274	LQ11 E2		PP			0	
1479	OXIDIZING SOLID, N.O.S.	5.1	O2	III	5.1	274	LQ12 E1		PP			0	
1481	PERCHLORATES, INORGANIC, N.O.S.	5.1	O2	II	5.1	274	LQ11 E2		PP			0	
1481	PERCHLORATES, INORGANIC, N.O.S.	5.1	O2	III	5.1	274	LQ12 E1		PP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1482	PERMANGANATES, INORGANIC, N.O.S.	5.1	O2	II	5.1	274 608	LQ11 E2		PP			0	
1482	PERMANGANATES, INORGANIC, N.O.S.	5.1	O2	III	5.1	274 608	LQ12 E1		PP			0	
1483	PEROXIDES, INORGANIC, N.O.S.	5.1	O2	II	5.1	274	LQ11 E2		PP			0	
1483	PEROXIDES, INORGANIC, N.O.S.	5.1	O2	III	5.1	274	LQ12 E1		PP			0	
1484	POTASSIUM BROMATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1485	POTASSIUM CHLORATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1486	POTASSIUM NITRATE	5.1	O2	III	5.1		LQ12 E1	B	PP	CO02 LO04		0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
1487	POTASSIUM NITRATE AND SODIUM NITRITE MIXTURE	5.1	O2	II	5.1	607	LQ11 E2		PP			0	
1488	POTASSIUM NITRITE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1489	POTASSIUM PERCHLORATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1490	POTASSIUM PERMANGANATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1491	POTASSIUM PEROXIDE	5.1	O2	I	5.1		LQ0 E0		PP			0	
1492	POTASSIUM PERSULPHATE	5.1	O2	III	5.1		LQ12 E1		PP			0	
1493	SILVER NITRATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1494	SODIUM BROMATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1495	SODIUM CHLORATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1496	SODIUM CHLORITE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1498	SODIUM NITRATE	5.1	O2	III	5.1		LQ12 E1	B	PP	CO02 LO04		0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
1499	SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE	5.1	O2	III	5.1		LQ12 E1	B	PP	CO02 LO04		0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
1500	SODIUM NITRITE	5.1	OT2	III	5.1+6.1	802	LQ12 E1		PP			0	
1502	SODIUM PERCHLORATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1503	SODIUM PERMANGANATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1504	SODIUM PEROXIDE	5.1	O2	I	5.1		LQ0 E0		PP			0	
1505	SODIUM PERSULPHATE	5.1	O2	III	5.1		LQ12 E1		PP			0	
1506	STRONTIUM CHLORATE	5.1	O2	II	5.1		LQ11 E2		PP			0	
1507	STRONTIUM NITRATE	5.1	O2	III	5.1		LQ12 E1	B	PP	CO02 LO04		0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
1508	STRONTIUM PERCHLORATE	5.1	O2	II	5.1		LQ11 E2		PP			0	

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1509	STRONTIUM PEROXIDE	5.1	O2	II	5.1		LQ11		PP			0	
1510	TETRANITROMETHANE	5.1	OT1	I	5.1+6.1	609 802	LQ0		PP, EP, TOX, A	VE02		2	
1511	UREA HYDROGEN PEROXIDE	5.1	OC2	III	5.1+8		LQ12		PP			0	
1512	ZINC AMMONIUM NITRITE	5.1	O2	II	5.1		LQ11		PP			0	
1513	ZINC CHLORATE	5.1	O2	II	5.1		LQ11		PP			0	
1514	ZINC NITRATE	5.1	O2	II	5.1		LQ11		PP			0	
1515	ZINC PERMANGANATE	5.1	O2	II	5.1		LQ11		PP			0	
1516	ZINC PEROXIDE	5.1	O2	II	5.1		LQ11		PP			0	
1517	ZIRCONIUM PICRAMATE, WETTED with not less than 20% water, by mass	4.1	D	I	4.1		LQ0		PP			1	
1541	ACETONE CYANOHYDRIN, STABILIZED	6.1	T1	I	6.1	802	LQ0	T	PP, EP, TOX, A	VE02		2	
1544	ALKALOIDS, SOLID, N.O.S. or ALKALOID SALTS, SOLID, N.O.S.	6.1	T2	I	6.1	43 274 802	LQ0		PP, EP			2	
1544	ALKALOIDS, SOLID, N.O.S. or ALKALOID SALTS, SOLID, N.O.S.	6.1	T2	II	6.1	43 274 802	LQ18		PP, EP			2	
1544	ALKALOIDS, SOLID, N.O.S. or ALKALOID SALTS, SOLID, N.O.S.	6.1	T2	III	6.1	43 274 802	LQ9		PP, EP			0	
1545	ALLYL ISOTHIOCYANATE, STABILIZED	6.1	TF1	II	6.1+3	802	LQ17	T	PP, EP, EX, TOX, A	VE01, VE02		2	
1546	AMMONIUM ARSENATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1547	ANILINE	6.1	T1	II	6.1	279 802	LQ17	T	PP, EP, TOX, A	VE02		2	
1548	ANILINE HYDROCHLORIDE	6.1	T2	III	6.1	802	LQ9		PP, EP			0	
1549	ANTIMONY COMPOUND, INORGANIC, SOLID, N.O.S.	6.1	T5	III	6.1	45 274 512 802	LQ9		PP, EP			0	
1550	ANTIMONY LACTATE	6.1	T5	III	6.1	802	LQ9		PP, EP			0	
1551	ANTIMONY POTASSIUM TARTRATE	6.1	T5	III	6.1	802	LQ9		PP, EP			0	
1553	ARSENIC ACID, LIQUID	6.1	T4	I	6.1	802	LQ0		PP, EP, TOX, A	VE02		2	
1554	ARSENIC ACID, SOLID	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1555	ARSENIC BROMIDE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1556	ARSENIC COMPOUND, LIQUID, N.O.S., inorganic, including: Arsenates, n.o.s., Arsenites, n.o.s.; and Arsenic sulphides, n.o.s.	6.1	T4	I	6.1	43 274 802	LQ0		PP, EP, TOX, A	VE02		2	
1556	ARSENIC COMPOUND, LIQUID, N.O.S., inorganic, including: Arsenates, n.o.s., Arsenites, n.o.s.; and Arsenic sulphides, n.o.s.	6.1	T4	II	6.1	43 274 802	LQ17		PP, EP, TOX, A	VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1556	ARSENIC COMPOUND, LIQUID, N.O.S., inorganic, including: Arsenates, n.o.s.; Arsenites, n.o.s.; and Arsenic sulphides, n.o.s.	6,1	T4	III	6,1	43 274 802	LQ7 E1		PP, EP, TOX, A	VE02		0	
1557	ARSENIC COMPOUND, SOLID, N.O.S., inorganic, including: Arsenates, n.o.s.; Arsenites, n.o.s.; and Arsenic sulphides, n.o.s.	6,1	T5	I	6,1	43 274 802	LQ0		PP, EP			2	
1557	ARSENIC COMPOUND, SOLID, N.O.S., inorganic, including: Arsenates, n.o.s.; Arsenites, n.o.s.; and Arsenic sulphides, n.o.s.	6,1	T5	II	6,1	43 274 802	LQ18		PP, EP			2	
1557	ARSENIC COMPOUND, SOLID, N.O.S., inorganic, including: Arsenates, n.o.s.; Arsenites, n.o.s.; and Arsenic sulphides, n.o.s.	6,1	T5	III	6,1	43 274 802	LQ9		PP, EP			0	
1558	ARSENIC	6,1	T5	II	6,1	802	LQ18		PP, EP			2	
1559	ARSENIC PENTOXIDE	6,1	T5	II	6,1	802	LQ18		PP, EP			2	
1560	ARSENIC TRICHLORIDE	6,1	T4	I	6,1	802	LQ0		PP, EP, TOX, A	VE02		2	
1561	ARSENIC TRIOXIDE	6,1	T5	II	6,1	802	LQ18		PP, EP			2	
1562	ARSENICAL DUST	6,1	T5	II	6,1	802	LQ18		PP, EP			2	
1564	BARIUM COMPOUND, N.O.S.	6,1	T5	II	6,1	177 274 513 587 802	LQ18		PP, EP			2	
1564	BARIUM COMPOUND, N.O.S.	6,1	T5	III	6,1	177 274 513 587 802	LQ9		PP, EP			0	
1565	BARIUM CYANIDE	6,1	T5	I	6,1	802	LQ0		PP, EP			2	
1566	BERYLLIUM COMPOUND, N.O.S.	6,1	T5	II	6,1	274 514 802	LQ18		PP, EP			2	
1566	BERYLLIUM COMPOUND, N.O.S.	6,1	T5	III	6,1	274 514 802	LQ9		PP, EP			0	
1567	BERYLLIUM POWDER	6,1	TF3	II	6,1+4,1	802	LQ18		PP, EP			2	
1569	BROMOACETONE	6,1	TF1	II	6,1+3	802	LQ17		PP, EP, EX, TOX, A	VE01, VE02		2	
1570	BRUCINE	6,1	T2	I	6,1	43 802	LQ0		PP, EP			2	
1571	BARIUM AZIDE, WETTED with not less than 50% water, by mass	4,1	DT	I	4,1+6,1	568 802	LQ0		PP			2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1572	CACODYLIC ACID	6.1	T5	II	6.1	802	LQ18	E4	PP, EP			2	
1573	CALCIUM ARSENATE	6.1	T5	II	6.1	802	LQ18	E4	PP, EP			2	
1574	CALCIUM ARSENATE AND CALCIUM ARSENITE MIXTURE, SOLID	6.1	T5	II	6.1	802	LQ18	E4	PP, EP			2	
1575	CALCIUM CYANIDE	6.1	T5	I	6.1	802	LQ0	E5	PP, EP			2	
1577	CHLORODINITROBENZENES, LIQUID	6.1	T1	II	6.1	279 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
1578	CHLORONITROBENZENES, SOLID	6.1	T2	II	6.1	279 802	LQ18	E4	PP, EP, TOX, A	VE02		2	
1579	4-CHLORO- <i>o</i> -TOLUIDINE HYDROCHLORIDE, SOLID	6.1	T2	III	6.1	802	LQ9	E1	PP, EP			0	
1580	CHLOROPICRIN	6.1	T1	I	6.1	802	LQ0	E5	PP, EP, TOX, A	VE02		2	
1581	CHLOROPICRIN AND METHYL BROMIDE MIXTURE with more than 2% chloropicrin	2	2T		2,3		LQ0	E0	PP, EP, TOX, A	VE02		2	
1582	CHLOROPICRIN AND METHYL CHLORIDE MIXTURE	2	2T		2,3		LQ0	E0	PP, EP, TOX, A	VE02		2	
1583	CHLOROPICRIN MIXTURE, N.O.S.	6.1	T1	I	6.1	274 315 515 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
1583	CHLOROPICRIN MIXTURE, N.O.S.	6.1	T1	II	6.1	274 515 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
1583	CHLOROPICRIN MIXTURE, N.O.S.	6.1	T1	III	6.1	274 515 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
1585	COPPER ACETOARSENITE	6.1	T5	II	6.1	802	LQ18	E4	PP, EP			2	
1586	COPPER ARSENITE	6.1	T5	II	6.1	802	LQ18	E4	PP, EP			2	
1587	COPPER CYANIDE	6.1	T5	II	6.1	802	LQ18	E4	PP, EP			2	
1588	CYANIDES, INORGANIC, SOLID, N.O.S.	6.1	T5	I	6.1	47 47 802	LQ0	E5	PP, EP			2	
1588	CYANIDES, INORGANIC, SOLID, N.O.S.	6.1	T5	II	6.1	47 274 802	LQ18	E4	PP, EP			2	
1588	CYANIDES, INORGANIC, SOLID, N.O.S.	6.1	T5	III	6.1	47 274 802	LQ9	E1	PP, EP			0	
1589	CYANOGEN CHLORIDE, STABILIZED	2	2TC		2,3+8		LQ0	E0	PP, EP, TOX, A	VE02		2	
1590	DICHLORANILINES, LIQUID	6.1	T1	II	6.1	279 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
1591	<i>o</i> -DICHLOROBENZENE	6.1	T1	III	6.1	279 802	LQ7	E1	PP, EP, TOX, A	VE02		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1593	DICHLOROMETHANE	6.1	T1	III	6.1	516 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
1594	DIETHYL SULPHATE	6.1	T1	II	6.1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
1595	DIMETHYL SULPHATE	6.1	TC1	I	6.1+8	802	LQ0	E5	PP, EP, TOX, A	VE02		2	
1596	DINITROANILINES	6.1	T2	II	6.1	802	LQ18	E4	PP, EP			2	
1597	DINITROBENZENES, LIQUID	6.1	T1	II	6.1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
1597	DINITROBENZENES, LIQUID	6.1	T1	III	6.1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
1598	DINITRO-o-CRESOL	6.1	T2	II	6.1	43 802	LQ18	E4	PP, EP			2	
1599	DINITROPHENOL SOLUTION	6.1	T1	II	6.1	802	LQ17	E4	PP, EP, A			2	
1599	DINITROPHENOL SOLUTION	6.1	T1	III	6.1	802	LQ7	E1	PP, EP, A			0	
1600	DINITROTOLUENES, MOLTEN	6.1	T1	II	6.1	802	LQ0	E0	PP, EP, TOX, A	VE02		2	
1601	DISINFECTANT, SOLID, TOXIC, N.O.S.	6.1	T2	I	6.1	274 802	LQ0	E5	PP, EP			2	
1601	DISINFECTANT, SOLID, TOXIC, N.O.S.	6.1	T2	II	6.1	274	LQ18	E4	PP, EP			2	
1601	DISINFECTANT, SOLID, TOXIC, N.O.S.	6.1	T2	III	6.1	274	LQ9	E1	PP, EP			0	
1602	DYE, LIQUID, TOXIC, N.O.S. or DYE INTERMEDIATE, LIQUID, TOXIC, N.O.S.	6.1	T1	I	6.1	274	LQ0	E5	PP, EP, TOX, A	VE02		2	
1602	DYE, LIQUID, TOXIC, N.O.S. or DYE INTERMEDIATE, LIQUID, TOXIC, N.O.S.	6.1	T1	II	6.1	274	LQ17	E4	PP, EP, TOX, A	VE02		2	
1602	DYE, LIQUID, TOXIC, N.O.S. or DYE INTERMEDIATE, LIQUID, TOXIC, N.O.S.	6.1	T1	III	6.1	274	LQ7	E1	PP, EP, TOX, A	VE02		0	
1603	ETHYL BROMOACETATE	6.1	TF1	II	6.1+3	802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
1604	ETHYLENEDIAMINE	8	CF1	II	8+3		LQ22	E2	PP, EP, EX, A	VE01		1	
1605	ETHYLENE DIBROMIDE	6.1	T1	I	6.1	802	LQ0	E5	PP, EP, TOX, A	VE02		2	
1606	FERRIC ARSENATE	6.1	T5	II	6.1	802	LQ18	E4	PP, EP			2	
1607	FERRIC ARSENITE	6.1	T5	II	6.1	802	LQ18	E4	PP, EP			2	
1608	FERROUS ARSENATE	6.1	T5	II	6.1	802	LQ18	E4	PP, EP			2	
1611	HEXAETHYL TETRAPHOSPHATE	6.1	T1	II	6.1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
1612	HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE	2	1T		2,3		LQ0	E0	PP, EP, TOX, A	VE02		2	
1613	HYDROCYANIC ACID, AQUEOUS SOLUTION (HYDROGEN CYANIDE, AQUEOUS SOLUTION) with not more than 20% hydrogen cyanide	6.1	TF1	I	6.1+3	48 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	

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(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
1614	HYDROGEN CYANIDE, STABILIZED, containing less than 3% water and absorbed in a porous inert material	6.1	TF1	I	6.1+3	603 802	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
1616	LEAD ACETATE	6.1	T5	III	6.1	802	LO9		PP, EP			0	
1617	LEAD ARSENATES	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1618	LEAD ARSENITES	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1620	LEAD CYANIDE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1621	LONDON PURPLE	6.1	T5	II	6.1	43 802	LQ18		PP, EP			2	
1622	MAGNESIUM ARSENATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1623	MERCURIC ARSENATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1624	MERCURIC CHLORIDE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1625	MERCURIC NITRATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1626	MERCURIC POTASSIUM CYANIDE	6.1	T5	I	6.1	802	LQ0		PP, EP			2	
1627	MERCURIUS NITRATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1629	MERCURY ACETATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1630	MERCURY AMMONIUM CHLORIDE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1631	MERCURY BENZOATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1634	MERCURY BROMIDES	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1636	MERCURY CYANIDE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1637	MERCURY GLUCONATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1638	MERCURY IODIDE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1639	MERCURY NUCLEATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1640	MERCURY OLEATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1641	MERCURY OXIDE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1642	MERCURY OXYCYANIDE, DESENSITIZED	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1643	MERCURY POTASSIUM IODIDE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1644	MERCURY SALICYLATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1645	MERCURY SULPHATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1646	MERCURY THIOCYANATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1647	METHYL BROMIDE AND ETHYLENE DIBROMIDE MIXTURE, LIQUID	6.1	T1	I	6.1	802	LQ0		PP, EP, TOX, A	VE02		2	
1648	ACETONITRILE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
1649	MOTOR FUEL ANTI-KNOCK MIXTURE having a flash-point above 60 °C	6.1	T3	I	6.1	802	LQ0	T	PP, EP, TOX, A	VE02		2	
1649	MOTOR FUEL ANTI-KNOCK MIXTURE having a flash-point of not more than 60 °C	6.1	TF1	I	6.1	802	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
1650	BETA-NAPHTHYLAMINE, SOLID	6.1	T2	II	6.1	802	LQ18		PP, EP			2	
1651	NAPHTHYLTHIOUREA	6.1	T2	II	6.1	43 802	LQ18		PP, EP			2	
1652	NAPHTHYLUREA	6.1	T2	II	6.1	802	LQ18		PP, EP			2	
1653	NICKEL CYANIDE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1654	NICOTINE	6.1	T1	II	6.1	802	LQ17		PP, EP, TOX, A	VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1655	NICOTINE COMPOUND, SOLID, N.O.S. or NICOTINE PREPARATION, SOLID, N.O.S.	6,1	T2	I	6,1	43 274 802	LQ0 E5		PP, EP			2	
1655	NICOTINE COMPOUND, SOLID, N.O.S. or NICOTINE PREPARATION, SOLID, N.O.S.	6,1	T2	II	6,1	43 274 802	LQ18 E4		PP, EP			2	
1655	NICOTINE COMPOUND, SOLID, N.O.S. or NICOTINE PREPARATION, SOLID, N.O.S.	6,1	T2	III	6,1	43 274 802	LQ9 E1		PP, EP			0	
1656	NICOTINE HYDROCHLORIDE, LIQUID or SOLUTION	6,1	T1	II	6,1	43 802	LQ17 E4		PP, EP, TOX, A	VE02		2	
1656	NICOTINE HYDROCHLORIDE, LIQUID or SOLUTION	6,1	T1	III	6,1	43 802	LQ7 E1		PP, EP, TOX, A	VE02		0	
1657	NICOTINE SALICYLATE	6,1	T2	II	6,1	802	LQ18 E4		PP, EP			2	
1658	NICOTINE SULPHATE, SOLUTION	6,1	T1	II	6,1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
1658	NICOTINE SULPHATE, SOLUTION	6,1	T1	III	6,1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
1659	NICOTINE TARTRATE	6,1	T2	II	6,1	802	LQ18 E4		PP, EP			2	
1660	NITRIC OXIDE, COMPRESSED	2	ITOC		2.3+5.1+8		LQ0 E0		PP, EP, TOX, A	VE02		2	
1661	NITROANILINES (o-, m-, p-)	6,1	T2	II	6,1	279 802	LQ18 E4		PP, EP			2	
1662	NITROBENZENE	6,1	T1	II	6,1	279 802	LQ17 E4	T	PP, EP, TOX, A	VE02		2	
1663	NITROPHENOLS (o-, m-, p-)	6,1	T2	III	6,1	279 802	LQ9 E1	T	PP, EP			0	
1664	NITROTOLUENES, LIQUID	6,1	T1	II	6,1	802	LQ17 E4	T	PP, EP, TOX, A	VE02		2	
1665	NITROXYLENES, LIQUID	6,1	T1	II	6,1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
1669	PENTACHLOROETHANE	6,1	T1	II	6,1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
1670	PERCHLOROMETHYL MERCAPTAN	6,1	T1	I	6,1	802	LQ0 E5		PP, EP, TOX, A	VE02		2	
1671	PHENOL, SOLID	6,1	T2	II	6,1	279 802	LQ18 E4		PP, EP			2	
1672	PHENYL CARBYLAMINE CHLORIDE	6,1	T1	I	6,1	802	LQ0 E5		PP, EP, TOX, A	VE02		2	
1673	PHENYLENEDIAMINES (o-, m-, p-)	6,1	T2	III	6,1	279 802	LQ9 E1		PP, EP			0	
1674	PHENYL MERCURIC ACETATE	6,1	T3	II	6,1	43 802	LQ18 E4		PP, EP, TOX, A	VE02		2	
1677	POTASSIUM ARSENATE	6,1	T5	II	6,1	802	LQ18 E4		PP, EP			2	
1678	POTASSIUM ARSENITE	6,1	T5	II	6,1	802	LQ18 E4		PP, EP			2	
1679	POTASSIUM CUPROCYANIDE	6,1	T5	II	6,1	802	LQ18 E4		PP, EP			2	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loadings, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	(3a)	(3b)	2.1.1.3 (4)	5.2.2 (5)	(6)	(7a) 3.4.6 3.5.1.2 (7b)	(8)	(9)	(10)	(11)	7.1.5 (12)	3.2.1 (13)
1680	POTASSIUM CYANIDE, SOLID	6.1	T5	I	6.1	802	LQ0		PP, EP			2	
1683	SILVER ARSENITE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1684	SILVER CYANIDE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1685	SODIUM ARSENATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1686	SODIUM ARSENITE, AQUEOUS SOLUTION	6.1	T4	II	6.1	43	LQ17		PP, EP			2	
1686	SODIUM ARSENITE, AQUEOUS SOLUTION	6.1	T4	III	6.1	43	LQ7		PP, EP			0	
1687	SODIUM AZIDE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1688	SODIUM CACODYLATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1689	SODIUM CYANIDE, SOLID	6.1	T5	I	6.1	802	LQ0		PP, EP			2	
1690	SODIUM FLUORIDE, SOLID	6.1	T5	III	6.1	802	LQ9	B	PP, EP			0	
1691	STRONTIUM ARSENITE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
1692	STRYCHNINE or STRYCHNINE SALTS	6.1	T2	I	6.1	802	LQ0		PP, EP			2	
1693	TEAR GAS SUBSTANCE, LIQUID, N.O.S.	6.1	T1	I	6.1	274	LQ0		PP, EP, TOX, A	VE02		2	
1693	TEAR GAS SUBSTANCE, LIQUID, N.O.S.	6.1	T1	II	6.1	802	LQ17		PP, EP, TOX, A	VE02		2	
1694	BROMOBENZYL CYANIDES, LIQUID	6.1	T1	I	6.1	138	LQ0		PP, EP, TOX, A	VE02		2	
1695	CHLOROACETONE, STABILIZED	6.1	TFC	I	6.1+3+8	302	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
1697	CHLOROACETOPHENONE, SOLID	6.1	T2	II	6.1	802	LQ18		PP, EP, TOX, A	VE02		2	
1698	DIPHENYLAMINE CHLOROARSINE	6.1	T3	I	6.1	802	LQ0		PP, EP, TOX, A	VE02		2	
1699	DIPHENYLCHLOROARSINE, LIQUID	6.1	T3	I	6.1	802	LQ0		PP, EP, TOX, A	VE02		2	
1700	TEAR GAS CANDLES	6.1	TF3	II	6.1+4.1	802	LQ18		PP, EP			2	
1701	XYLYL BROMIDE, LIQUID	6.1	T1	II	6.1	802	LQ17		PP, EP, TOX, A	VE02		2	
1702	1,1,2,2-TETRACHLOROETHANE	6.1	T1	II	6.1	802	LQ17		PP, EP, TOX, A	VE02		2	
1704	TETRAETHYL DITHIOPYROPHOSPHATE	6.1	T2	II	6.1	43	LQ18		PP, EP			2	
1707	THALLIUM COMPOUND, N.O.S.	6.1	T5	II	6.1	43	LQ18		PP, EP			2	
1708	TOLUIDINES, LIQUID	6.1	T1	II	6.1	279	LQ17	T	PP, EP, TOX, A	VE02		2	
1709	2,4-TOLUYLENEDIAMINE, SOLID	6.1	T2	III	6.1	802	LQ9		PP, EP			0	
1710	TRICHLOROETHYLENE	6.1	T1	III	6.1	802	LQ7	T	PP, EP, TOX, A	VE02		0	
1711	XYLIDINES, LIQUID	6.1	T1	II	6.1	802	LQ17		PP, EP, TOX, A	VE02		2	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loadings, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	(3a)	(3b)	2.1.1.3 (4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
1712	ZINC ARSENATE, ZINC ARSENITE or ZINC ARSENATE AND ZINC ARSENITE MIXTURE	6,1	T5	II	6,1	802	LQ18	E4	PP, EP			2	
1713	ZINC CYANIDE	6,1	T5	I	6,1	802	LQ0	E5	PP, EP			2	
1714	ZINC PHOSPHIDE	4,3	WT2	I	4,3+6,1	802	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02	HA08	2	
1715	ACETIC ANHYDRIDE	8	CF1	II	8+3		LQ22	E2	PP, EP, EX, A	VE01		1	
1716	ACETYL BROMIDE	8	C3	II	8		LQ22	E2	PP, EP			0	
1717	ACETYL CHLORIDE	3	FC	II	3+8		LQ4	E2	PP, EP, EX, A	VE01		1	
1718	BUTYL ACID PHOSPHATE	8	C3	III	8		LQ7	E1	PP, EP			0	
1719	CAUSTIC ALKALI LIQUID, N.O.S.	8	C5	II	8	274	LQ22	E2	PP, EP			0	
1719	CAUSTIC ALKALI LIQUID, N.O.S.	8	C5	III	8	274	LQ7	E1	PP, EP			0	
1722	ALLYL CHLOROFORMATE	6,1	TFC	I	6,1+3+8	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
1723	ALLYL IODIDE	3	FC	II	3+8		LQ4	E2	PP, EP, EX, A	VE01		1	
1724	ALLYL TRICHLOROSILANE, STABILIZED	8	CF1	II	8+3		LQ22	E2	PP, EP, EX, A	VE01		1	
1725	ALUMINIUM BROMIDE, ANHYDROUS	8	C2	II	8	588	LQ23	E2	PP, EP			0	
1726	ALUMINIUM CHLORIDE, ANHYDROUS	8	C2	II	8	588	LQ23	E2	PP, EP			0	
1727	AMMONIUM HYDROGENDIFLUORIDE, SOLID	8	C2	II	8		LQ23	E2	PP, EP			0	
1728	AMYL TRICHLOROSILANE	8	C3	II	8		LQ22	E2	PP, EP			0	
1729	ANISOYL CHLORIDE	8	C4	II	8		LQ23	E2	PP, EP			0	
1730	ANTIMONY PENTACHLORIDE, LIQUID	8	C1	II	8		LQ22	E2	PP, EP			0	
1731	ANTIMONY PENTACHLORIDE SOLUTION	8	C1	II	8		LQ22	E2	PP, EP			0	
1731	ANTIMONY PENTACHLORIDE SOLUTION	8	C1	III	8		LQ7	E1	PP, EP			0	
1732	ANTIMONY PENTAFLUORIDE	8	CT1	II	8+6,1	802	LQ22	E2	PP, EP, TOX, A	VE02		2	
1733	ANTIMONY TRICHLORIDE	8	C2	II	8		LQ23	E2	PP, EP			0	
1736	BENZOYL CHLORIDE	8	C3	II	8		LQ22	E2	PP, EP			0	
1737	BENZYL BROMIDE	6,1	TC1	II	6,1+8	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
1738	BENZYL CHLORIDE	6,1	TC1	II	6,1+8	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
1739	BENZYL CHLOROFORMATE	8	C9	I	8		LQ0	E0	PP, EP			0	
1740	HYDROGENDIFLUORIDES, SOLID, N.O.S.	8	C2	II	8	274	LQ23	E2	PP, EP			0	
1740	HYDROGENDIFLUORIDES, SOLID, N.O.S.	8	C2	III	8	517	LQ24	E1	PP, EP			0	
1741	BORON TRICHLORIDE	2	2TC		2,3+8	517	LQ0	E0	PP, EP, TOX, A	VE02		2	
1742	BORON TRIFLUORIDE ACETIC ACID COMPLEX, LIQUID	8	C3	II	8		LQ22	E2	PP, EP			0	
1743	BORON TRIFLUORIDE PROPIONIC ACID COMPLEX, LIQUID	8	C3	II	8		LQ22	E2	PP, EP			0	
1744	BROMINE or BROMINE SOLUTION	8	CT1	I	8+6,1	802	LQ0	E0	PP, EP, TOX, A	VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1745	BROMINE PENTAFLUORIDE	5,1	OTC	I	5.1+6.1+8	802	LQ0	E0	PP, EP, TOX, A	VE02		2	
1746	BROMINE TRIFLUORIDE	5,1	OTC	I	5.1+6.1+8	802	LQ0	E0	PP, EP, TOX, A	VE02		2	
1747	BUTYLTRICHLOROSILANE	8	CF1	II	8+3		LQ22	E2	PP, EP, EX, A	VE01		1	
1748	CALCIUM HYPOCHLORITE, DRY or CALCIUM HYPOCHLORITE MIXTURE, DRY with more than 39% available chlorine (8.8% available oxygen)	5,1	O2	II	5,1	313 314 589	LQ11	E2	PP			0	
1748	CALCIUM HYPOCHLORITE, DRY or CALCIUM HYPOCHLORITE MIXTURE, DRY with more than 39% available chlorine (8.8% available oxygen)	5,1	O2	III	5,1	316 589	LQ12	E1	PP			0	
1749	CHLORINE TRIFLUORIDE	2	2TOC		2.3+5.1+8		LQ0	E0	PP, EP, TOX, A	VE02		2	
1750	CHLOROACETIC ACID SOLUTION	6,1	TC1	II	6.1+8	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
1751	CHLOROACETIC ACID, SOLID	6,1	TC2	II	6.1+8	802	LQ18	E4	PP, EP			2	
1752	CHLOROACETYL CHLORIDE	6,1	TC1	I	6.1+8	802	LQ0	E5	PP, EP, TOX, A	VE02		2	
1753	CHLOROPHENYLTRICHLOROSILANE	8	C3	II	8		LQ22	E2	PP, EP			0	
1754	CHLOROSULPHONIC ACID (with or without sulphur trioxide)	8	C1	I	8		LQ0	E0	PP, EP			0	
1755	CHROMIC ACID SOLUTION	8	C1	II	8	518	LQ22	E2	PP, EP			0	
1755	CHROMIC ACID SOLUTION	8	C1	III	8	518	LQ7	E1	PP, EP			0	
1756	CHROMIC FLUORIDE, SOLID	8	C2	II	8		LQ23	E2	PP, EP			0	
1757	CHROMIC FLUORIDE SOLUTION	8	C1	II	8		LQ22	E2	PP, EP			0	
1757	CHROMIC FLUORIDE SOLUTION	8	C1	III	8		LQ7	E1	PP, EP			0	
1758	CHROMIUM OXYCHLORIDE	8	C1	I	8		LQ0	E0	PP, EP			0	
1759	CORROSIVE SOLID, N.O.S.	8	C10	I	8	274	LQ0	E0	PP, EP			0	
1759	CORROSIVE SOLID, N.O.S.	8	C10	II	8	274	LQ23	E2	PP, EP			0	
1759	CORROSIVE SOLID, N.O.S.	8	C10	III	8	274	LQ24	E1	PP, EP			0	
1760	CORROSIVE LIQUID, N.O.S.	8	C9	I	8	274	LQ0	E0	PP, EP			0	
1760	CORROSIVE LIQUID, N.O.S.	8	C9	II	8	274	LQ22	E2	PP, EP			0	
1760	CORROSIVE LIQUID, N.O.S.	8	C9	III	8	274	LQ7	E1	PP, EP			0	
1761	CUPRIETHYLENEDIAMINE SOLUTION	8	CT1	II	8+6.1	802	LQ22	E2	PP, EP, A			2	
1761	CUPRIETHYLENEDIAMINE SOLUTION	8	CT1	III	8+6.1	802	LQ7	E1	PP, EP, A			0	
1762	CYCLOHEXYLTRICHLOROSILANE	8	C3	II	8		LQ22	E2	PP, EP			0	
1763	CYCLOHEXYLTRICHLOROSILANE	8	C3	II	8		LQ22	E2	PP, EP			0	
1764	DICHLOROACETIC ACID	8	C3	II	8		LQ22	E2	PP, EP			0	
1765	DICHLOROACETYL CHLORIDE	8	C3	II	8		LQ22	E2	PP, EP			0	
1766	DICHLOROPHENYLTRICHLOROSILANE	8	C3	II	8		LQ22	E2	PP, EP			0	
1767	DIETHYLCHLOROSILANE	8	CF1	II	8+3		LQ22	E2	PP, EP, EX, A	VE01		1	
1768	DIFLUOROPHOSPHORIC ACID, ANHYDROUS	8	C1	II	8		LQ22	E2	PP, EP			0	
1769	DIPHENYLDICHLOROSILANE	8	C3	II	8		LQ22	E2	PP, EP			0	

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(1)	3.1.2 (2)	(3a)	(3b)	2.1.1.3 (4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
1770	DIPHENYLMETHYL BROMIDE	8	C10	II	8		LQ23		PP, EP			0	
1771	DODECYLTRICHLOROSILANE	8	C3	II	8		LQ22		PP, EP			0	
1773	FERRIC CHLORIDE, ANHYDROUS	8	C2	III	8	590	LQ24		PP, EP			0	
1774	FIRE EXTINGUISHER CHARGES, corrosive liquid	8	C11	II	8		LQ22		PP, EP			0	
1775	FLUOROBORIC ACID	8	C1	II	8		LQ22		PP, EP			0	
1776	FLUOROPHOSPHORIC ACID, ANHYDROUS	8	C1	II	8		LQ22		PP, EP			0	
1777	FLUOROSULPHONIC ACID	8	C1	I	8		LQ0		PP, EP			0	
1778	FLUOROSILICIC ACID	8	C1	II	8		LQ22	T	PP, EP			0	
1779	FORMIC ACID with more than 85% acid by mass	8	CF1	II	8+3		LQ22	T	PP, EP, EX, A			0	
1780	FUMARYL CHLORIDE	8	C3	II	8		LQ22	T	PP, EP			0	
1781	HEXADECYLTRICHLOROSILANE	8	C3	II	8		LQ22		PP, EP			0	
1782	HEXAFLUOROPHOSPHORIC ACID	8	C1	II	8		LQ22		PP, EP			0	
1783	HEXAMETHYLENEDIAMINE SOLUTION	8	C7	II	8		LQ22	T	PP, EP			0	
1783	HEXAMETHYLENEDIAMINE SOLUTION	8	C7	III	8		LQ7	T	PP, EP			0	
1784	HEXYLTRICHLOROSILANE	8	C3	II	8		LQ22		PP, EP			0	
1786	HYDROFLUORIC ACID AND SULPHURIC ACID MIXTURE	8	CT1	I	8+6.1	802	LQ0		PP, EP, TOX, A	VE02		2	
1787	HYDRIOIC ACID	8	C1	II	8		LQ22		PP, EP			0	
1787	HYDRIOIC ACID	8	C1	III	8		LQ7		PP, EP			0	
1788	HYDROBROMIC ACID	8	C1	II	8	519	LQ22		PP, EP			0	
1788	HYDROBROMIC ACID	8	C1	III	8	519	LQ7		PP, EP			0	
1789	HYDROCHLORIC ACID	8	C1	II	8	520	LQ22	T	PP, EP			0	
1789	HYDROCHLORIC ACID	8	C1	III	8	520	LQ7	T	PP, EP			0	
1790	HYDROFLUORIC ACID with more than 85% hydrofluoric acid	8	CT1	I	8+6.1	6401	LQ0		PP, EP, TOX, A	VE02		2	
1790	HYDROFLUORIC ACID with more than 60% but not more than 85% hydrofluoric acid	8	CT1	I	8+6.1	6401	LQ0		PP, EP, TOX, A	VE02		2	
1790	HYDROFLUORIC ACID with not more than 60% hydrofluoric acid	8	CT1	II	8+6.1	802	LQ22		PP, EP, TOX, A	VE02		2	
1791	HYPOCHLORITE SOLUTION	8	C9	II	8	521	LQ22		PP, EP			0	
1791	HYPOCHLORITE SOLUTION	8	C9	III	8	521	LQ7		PP, EP			0	
1792	IODINE MONOCHLORIDE	8	C1	II	8		LQ22		PP, EP			0	
1793	ISOPROPYL ACID PHOSPHATE	8	C3	III	8		LQ7		PP, EP			0	
1794	LEAD SULPHATE with more than 3% free acid	8	C2	II	8	591	LQ23		PP, EP			0	
1796	NITRATING ACID MIXTURE with more than 50% nitric acid	8	CO1	I	8+5.1		LQ0		PP, EP			0	
1796	NITRATING ACID MIXTURE with not more than 50% nitric acid	8	C1	II	8		LQ22		PP, EP			0	
1798	NITROHYDROCHLORIC ACID	8	COT										
1799	NONYLTRICHLOROSILANE	8	C3	II	8		LQ22		PP, EP			0	
1800	OCTADECYLTRICHLORO-SILANE	8	C3	II	8		LQ22		PP, EP			0	
1801	OCTYLTRICHLOROSILANE	8	C3	II	8		LQ22		PP, EP			0	

CARRIAGE PROHIBITED

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1802	PERCHLORIC ACID with not more than 50% acid, by mass	8	CO1	II	8+5.1	522	LQ22 E2		PP, EP			0	
1803	PHENOLSULFONIC ACID, LIQUIF	8	C3	II	8		LQ22 E2		PP, EP			0	
1804	PHENYLTRICHLOROSILANE	8	C3	II	8		LQ22 E2		PP, EP			0	
1805	PHOSPHORIC ACID, SOLUTION	8	C1	III	8		LQ7 E1	T	PP, EP			0	
1806	PHOSPHORUS PENTACHLORIDE	8	C2	II	8		LQ23 E2		PP, EP			0	
1807	PHOSPHORUS PENTOXIDE	8	C2	II	8		LQ23 E2		PP, EP			0	
1808	PHOSPHORUS TRIBROMIDE	8	C1	II	8		LQ22 E2		PP, EP			0	
1809	PHOSPHORUS TRICHLORIDE	6.1	TC3	I	6.1+8	802	LQ0 E5		PP, EP, TOX, A	VE02		2	
1810	PHOSPHORUS OXYCHLORIDE	8	C1	II	8		LQ22 E2		PP, EP			0	
1811	POTASSIUM HYDROGENDIFLUORIDE, SOLID	8	CT2	II	8+6.1	802	LQ23 E2		PP, EP			2	
1812	POTASSIUM FLUORIDE, SOLID	6.1	T5	III	6.1	802	LQ9 E1	B	PP, EP			0	
1813	POTASSIUM HYDROXIDE, SOLID	8	C6	II	8		LQ23 E2		PP, EP			0	
1814	POTASSIUM HYDROXIDE SOLUTION	8	C5	II	8		LQ22 E2	T	PP, EP			0	
1814	POTASSIUM HYDROXIDE SOLUTION	8	C5	III	8		LQ7 E1	T	PP, EP			0	
1815	PROPIONYL CHLORIDE	3	FC	II	3+8		LQ4 E2		PP, EP, EX, A	VE01		1	
1816	PROPYLTRICHLOROSILANE	8	CF1	II	8+3		LQ22 E2		PP, EP, EX, A	VE01		1	
1817	PYROSULPHURYL CHLORIDE	8	C1	II	8		LQ22 E2		PP, EP			0	
1818	SILICON TETRACHLORIDE	8	C1	II	8		LQ0 E2		PP, EP			0	
1819	SODIUM ALUMINATE SOLUTION	8	C5	II	8		LQ22 E2		PP, EP			0	
1819	SODIUM ALUMINATE SOLUTION	8	C5	III	8		LQ7 E1		PP, EP			0	
1823	SODIUM HYDROXIDE, SOLID	8	C6	II	8		LQ23 E2	T	PP, EP			0	
1824	SODIUM HYDROXIDE SOLUTION	8	C5	II	8		LQ22 E2	T	PP, EP			0	
1824	SODIUM HYDROXIDE SOLUTION	8	C5	III	8		LQ7 E1	T	PP, EP			0	
1825	SODIUM MONOXIDE	8	C6	II	8		LQ23 E2		PP, EP			0	
1826	NITRATING ACID MIXTURE, SPENT, with more than 50% nitric acid	8	CO1	I	8+5.1	113	LQ0 E0		PP, EP			0	
1826	NITRATING ACID MIXTURE, SPENT, with not more than 50% nitric acid	8	C1	II	8	113	LQ22 E2		PP, EP			0	
1827	STANNIC CHLORIDE, ANHYDROUS	8	C1	II	8		LQ22 E2		PP, EP			0	
1828	SULPHUR CHLORIDES	8	C1	I	8		LQ0 E0		PP, EP			0	
1829	SULPHUR TRIOXIDE, STABILIZED	8	C1	I	8	623	LQ0 E0		PP, EP			0	
1830	SULPHURIC ACID with more than 51% acid	8	C1	II	8		LQ22 E2	T	PP, EP			0	
1831	SULPHURIC ACID, FUMING	8	CT1	I	8+6.1	802	LQ0 E0	T	PP, EP, TOX, A	VE02		2	
1832	SULPHURIC ACID, SPENT	8	C1	II	8	113	LQ22 E2	T	PP, EP			0	
1833	SULPHUROUS ACID	8	C1	II	8		LQ22 E2		PP, EP			0	
1834	SULPHURYL CHLORIDE	8	C1	I	8		LQ0 E0		PP, EP			0	
1835	TETRAMETHYLAMMONIUM HYDROXIDE, SOLUTION	8	C7	II	8		LQ22 E2		PP, EP			0	
1835	TETRAMETHYLAMMONIUM HYDROXIDE SOLUTION	8	C7	III	8		LQ7 E1		PP, EP			0	
1836	THIONYL CHLORIDE	8	C1	I	8		LQ0 E0		PP, EP			0	
1837	THIOPHOSPHORYL CHLORIDE	8	C1	II	8		LQ22 E2		PP, EP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1838	TITANIUM TETRACHLORIDE	8	C1	II	8		LQ22 E2		PP, EP			0	
1839	TRICHLOROACETIC ACID	8	C4	II	8		LQ23 E2		PP, EP			0	
1840	ZINC CHLORIDE SOLUTION	8	C1	III	8		LQ7 E1		PP, EP			0	
1841	ACETALDEHYDE AMMONIA	9	M11	III	9		LQ27 E1		PP			0	
1843	AMMONIUM DINITRO-o-CRESOLATE, SOLID	6,1	T2	II	6,1	802	LQ18 E4		PP, EP			2	
1845	Carbon dioxide, solid (Dry ice)	9	M11										
1846	CARBON TETRACHLORIDE	6,1	T1	II	6,1	802	LQ17 E4	T	PP, EP, TOX, A	VE02		2	
1847	POTASSIUM SULPHIDE, HYDRATED with not less than 30% water of crystallization	8	C6	II	8	523	LQ23 E2		PP, EP			0	
1848	PROPIONIC ACID with not less than 10% and less than 90% acid by mass	8	C3	III	8		LQ7 E1	T	PP, EP			0	
1849	SODIUM SULPHIDE, HYDRATED with not less than 30% water	8	C6	II	8	523	LQ23 E2		PP, EP			0	
1851	MEDICINE, LIQUID, TOXIC, N.O.S.	6,1	T1	II	6,1	221 274 601 802	LQ17 E4		PP, EP, TOX, A	VE02		2	
1851	MEDICINE, LIQUID, TOXIC, N.O.S.	6,1	T1	III	6,1	221 274 601 802	LQ7 E1		PP, EP, TOX, A	VE02		0	
1854	BARIUM ALLOYS, PYROPHORIC	4,2	S4	I	4,2		LQ0 E0		PP			0	
1855	CALCIUM, PYROPHORIC or CALCIUM ALLOYS, PYROPHORIC	4,2	S4	I	4,2		LQ0 E0		PP			0	
1856	Rags, oily	4,2	S2										
1857	Textile waste, wet	4,2	S2										
1858	HEXAFLUOROPROPYLENE (REFRIGERANT GAS R 1216)	2	2A		2,2		LQ1 E1		PP			0	
1859	SILICON TETRAFLUORIDE	2	2TC		2,3+8		LQ0 E0		PP, EP, TOX, A	VE02		2	
1860	VINYL FLUORIDE, STABILIZED	2	2F		2,1		LQ0 E0		PP, EX, A	VE01		1	
1862	ETHYL CROTONATE	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
1863	FUEL, AVIATION, TURBINE ENGINE	3	F1	I	3		LQ3 E3	T	PP, EX, A	VE01		1	
1863	FUEL, AVIATION, TURBINE ENGINE (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	640C	LQ4 E2	T	PP, EX, A	VE01		1	
1863	FUEL, AVIATION, TURBINE ENGINE (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	640D	LQ4 E2	T	PP, EX, A	VE01		1	
1863	FUEL, AVIATION, TURBINE ENGINE	3	F1	III	3		LQ7 E1	T	PP, EX, A	VE01		0	
1865	n-PROPYL NITRATE	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
1866	RESIN SOLUTION, flammable	3	F1	I	3		LQ3 E3		PP, EX, A	VE01		1	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
1866	3.1.2 (2) RESIN SOLUTION, flammable (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	640C	LQ6	E2	PP, EX, A	VE01		1	3.2.1 (13)
1866	RESIN SOLUTION, flammable (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	640D	LQ6	E2	PP, EX, A	VE01		1	
1866	RESIN SOLUTION, flammable	3	F1	III	3	640E	LQ7	E1	PP, EX, A	VE01		0	
1866	RESIN SOLUTION, flammable (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (boiling point not more than 35° C)	3	F1	III	3	640F	LQ7	E1	PP, EX, A	VE01		0	
1866	RESIN SOLUTION, flammable (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C more than 110 kPa, boiling point of more than 35° C)	3	F1	III	3	640G	LQ7	E1	PP, EX, A	VE01		0	
1866	RESIN SOLUTION, flammable (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3	640H	LQ7	E1	PP, EX, A	VE01		0	
1868	DECABORANE	4.1	FT2	II	4.1+6.1	802	LQ0	E2	PP			2	
1869	MAGNESIUM or MAGNESIUM ALLOYS with more than 50% magnesium in pellets, turnings or ribbons	4.1	F3	III	4.1	59	LQ9	E1	PP			0	
1870	POTASSIUM BOROHYDRIDE	4.3	W2	I	4.3		LQ0	E0	PP, EX, A	VE01	HA08	0	
1871	TITANIUM HYDRIDE	4.1	F3	II	4.1		LQ8	E2	PP			1	
1872	LEAD DIOXIDE	5.1	OT2	III	5.1+6.1	802	LQ12	E1	PP			0	
1873	PERCHLORIC ACID with more than 50% but not more than 72% acid, by mass	5.1	OC1	I	5.1+8	60	LQ0	E0	PP, EP			0	
1884	BARIUM OXIDE	6.1	T5	III	6.1	802	LQ9	E1	PP, EP			0	
1885	BENZIDINE	6.1	T2	II	6.1	802	LQ18	E4	PP, EP			2	
1886	BENZYLIDENE CHLORIDE	6.1	T1	II	6.1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
1887	BROMOCHLOROMETHANE	6.1	T1	III	6.1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
1888	CHLOROFORM	6.1	T1	III	6.1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
1889	CYANOGEN BROMIDE	6.1	TC2	I	6.1+8	802	LQ0	E5	PP, EP			2	
1891	ETHYL BROMIDE	6.1	T1	II	6.1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
1892	ETHYLDICHLOROARSINE	6.1	T3	I	6.1	802	LQ0	E5	PP, EP, TOX, A	VE02		2	
1894	PHENYLMERCURIC HYDROXIDE	6.1	T3	II	6.1	802	LQ18	E4	PP, EP, TOX, A	VE02		2	
1895	PHENYLMERCURIC NITRATE	6.1	T3	II	6.1	802	LQ18	E4	PP, EP, TOX, A	VE02		2	
1897	TETRACHLOROETHYLENE	6.1	T1	III	6.1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
1898	ACETYL IODIDE	8	C3	II	8		LQ22	E2	PP, EP			0	
1902	DIISOCTYL ACID PHOSPHATE	8	C3	III	8		LQ7	E1	PP, EP			0	

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(1)	3.1.2 (2)	(3a)	(3b)	2.1.1.3 (4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
1903	DISINFECTANT, LIQUID, CORROSIVE, N.O.S.	8	C9	I	8	274	LQ0	E0	PP, EP			0	
1903	DISINFECTANT, LIQUID, CORROSIVE, N.O.S.	8	C9	II	8	274	LQ22	E2	PP, EP			0	
1903	DISINFECTANT, LIQUID, CORROSIVE, N.O.S.	8	C9	III	8	274	LQ7	E1	PP, EP			0	
1905	SELENIC ACID	8	C2	I	8		LQ0	E0	PP, EP			0	
1906	SLUDGE ACID	8	C1	II	8		LQ22	E2	PP, EP			0	
1907	SODA LIME with more than 4% sodium hydroxide	8	C6	III	8	62	LQ24	E1	PP, EP			0	
1908	CHLORITE SOLUTION	8	C9	II	8	521	LQ22	E2	PP, EP			0	
1908	CHLORITE SOLUTION	8	C9	III	8	521	LQ7	E1	PP, EP			0	
1910	Calcium oxide	8	C6										
1911	DIBORANE	2	2TF		2.3+2.1		LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
1912	METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	2	2F		2.1	228	LQ0	E0	PP, EX, A	VE01		1	
1913	NEON, REFRIGERATED LIQUID	2	3A		2.2	593	LQ1	E1	PP			0	
1914	BUTYL PROPIONATES	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1915	CYCLOHEXANONE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1916	2,2'-DICHLORODIETHYL ETHER	6.1	TF1	II	6.1+3	802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
1917	ETHYL ACRYLATE, STABILIZED	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1918	ISOPROPYL BENZENE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1919	METHYL ACRYLATE, STABILIZED	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
1920	NONANES	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
1921	PROPYLENEIMINE, STABILIZED	3	FT1	I	3+6.1	802	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
1922	PYRROLIDINE	3	FC	II	3+8		LQ4	E2	PP, EP, EX, A	VE01		1	
1923	CALCIUM DITHIONITE (CALCIUM HYDROSULPHITE)	4.2	S4	II	4.2		LQ0	E2	PP			0	
1928	METHYL MAGNESIUM BROMIDE IN ETHYL ETHER	4.3	WF1	I	4.3+3		LQ0	E0	PP, EX, A	VE01	HA08	1	
1929	POTASSIUM DITHIONITE (POTASSIUM HYDROSULPHITE)	4.2	S4	II	4.2		LQ0	E2	PP			0	
1931	ZINC DITHIONITE (ZINC HYDROSULPHITE)	9	M11	III	9		LQ27	E1	PP			0	
1932	ZIRCONIUM SCRAP	4.2	S4	III	4.2	524 592	LQ0	E1	PP			0	
1935	CYANIDE SOLUTION, N.O.S.	6.1	T4	I	6.1	274 525 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
1935	CYANIDE SOLUTION, N.O.S.	6.1	T4	II	6.1	274 525 802	LQ17	E4	PP, EP, TOX, A	VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1935	CYANIDE SOLUTION, N.O.S.	6,1	T4	III	6,1	274 525 802	LQ7 E1	E1	PP, EP, TOX, A	VE02		0	
1938	BROMOACETIC ACID, SOLUTION	8	C3	II	8		LQ22	E2	PP, EP			0	
1938	BROMOACETIC ACID, SOLUTION	8	C3	III	8		LQ7	E1	PP, EP			0	
1939	PHOSPHORUS OXYBROMIDE	8	C2	II	8		LQ23	E2	PP, EP			0	
1940	THIOGLYCOLIC ACID	8	C3	II	8		LQ22	E2	PP, EP			0	
1941	DIBROMODIFLUOROMETHANE	9	M11	III	9		LQ28	E1	PP			0	
1942	AMMONIUM NITRATE with not more than 0,2% total combustible material, including any organic substance calculated as carbon, to the exclusion of any other added substance	5,1	O2	III	5,1	306 611	LQ12	E1	PP	ST01, HA09 CO02		0	CO02 and HA09 apply only when this substance is carried in bulk or without packaging
1944	MATCHES, SAFETY (book, card or strike on box)	4,1	F1	III	4,1	293	LQ9	E1	PP			0	
1945	MATCHES, WAX VESTA	4,1	F1	III	4,1	293	LQ9	E1	PP			0	
1950	AEROSOLS, asphyxiant	2	5A		2,2	190 327 625	LQ2	E0	PP	VE04		0	
1950	AEROSOLS, corrosive	2	5C		2,2+8	190 327 625	LQ2	E0	PP, EP	VE04		0	
1950	AEROSOLS, corrosive, oxidizing	2	5CO		2,2+5,1+8	190 327 625	LQ2	E0	PP, EP	VE04		0	
1950	AEROSOLS, flammable	2	5F		2,1	190 327 625	LQ2	E0	PP, EX, A	VE01, VE04		1	
1950	AEROSOLS, flammable, corrosive	2	5FC		2,1+8	190 327 625	LQ2	E0	PP, EX, A	VE01, VE04		1	
1950	AEROSOLS, oxidizing	2	5O		2,2+5,1	190 327 625	LQ2	E0	PP	VE04		0	
1950	AEROSOLS, toxic	2	5T		2,2+6,1	190 327 625	LQ1	E0	PP, EP, TOX, A	VE02, VE04		2	
1950	AEROSOLS, toxic, corrosive	2	5TC		2,2+6,1+8	190 327 625	LQ1	E0	PP, EP, TOX, A	VE02, VE04		2	
1950	AEROSOLS, toxic, flammable	2	5TF		2,1+6,1	190 327 625	LQ1	E0	PP, EP, EX, TOX, A	VE01, VE02, VE04		2	
1950	AEROSOLS, toxic, flammable, corrosive	2	5TFC		2,1+6,1+8	190 327 625	LQ1	E0	PP, EP, EX, TOX, A	VE01, VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1950	AEROSOLS, toxic, oxidizing	2	5TO	2.2+5.1+6.1	190 327 625	LQ1 E0	PP, EP, TOX, A	VE02, VE04			2		
1950	AEROSOLS, toxic, oxidizing, corrosive	2	5TOC	2.2+5.1+6.1+8	190 327 625	LQ1 E0	PP, EP, TOX, A	VE02, VE04			2		
1951	ARGON, REFRIGERATED LIQUID	2	3A	2.2	593	LQ1 E1	PP				0		
1952	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with not more than 9% ethylene oxide	2	2A	2.2		LQ1 E1	PP				0		
1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.	2	1TF	2.3+2.1	274	LQ0 E0	PP, EP, EX, TOX, A	VE01, VE02			2		
1954	COMPRESSED GAS, FLAMMABLE, N.O.S.	2	1F	2.1	274	LQ0 E0	PP, EX, A	VE01			1		
1955	COMPRESSED GAS, TOXIC, N.O.S.	2	1T	2.3	274	LQ0 E0	PP, EP, TOX, A	VE02			2		
1956	COMPRESSED GAS, N.O.S.	2	1A	2.2	274 292 567	LQ1 E1	PP				0		
1957	DEUTERIUM, COMPRESSED	2	1F	2.1		LQ0 E0	PP, EX, A	VE01			1		
1958	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 114)	2	2A	2.2		LQ1 E1	PP				0		
1959	1,1-DIFLUOROETHYLENE (REFRIGERANT GAS R 1132a)	2	2F	2.1		LQ0 E0	PP, EX, A	VE01			1		
1961	ETHANE, REFRIGERATED LIQUID	2	3F	2.1		LQ0 E0	PP, EX, A	VE01			1		
1962	ETHYLENE	2	2F	2.1		LQ0 E0	PP, EX, A	VE01			1		
1963	HELIUM, REFRIGERATED LIQUID	2	3A	2.2	593	LQ1 E1	PP				0		
1964	HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S.	2	1F	2.1	274	LQ0 E0	PP, EX, A	VE01			1		
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. such as mixtures A, A01, A02, A0, A1, B1, B2, B or C	2	2F	2.1	274 583	LQ0 E0	PP, EX, A	VE01			1		
1966	HYDROGEN, REFRIGERATED LIQUID	2	3F	2.1		LQ0 E0	PP, EX, A	VE01			1		
1967	INSECTICIDE GAS, TOXIC, N.O.S.	2	2T	2.3	274	LQ0 E0	PP, EP, TOX, A	VE02			2		
1968	INSECTICIDE GAS, N.O.S.	2	2A	2.2	274	LQ1 E1	PP				0		
1969	ISOBUTANE	2	2F	2.1		LQ0 E0	PP, EX, A	VE01			1		
1970	KRYPTON, REFRIGERATED LIQUID	2	3A	2.2	593	LQ1 E1	PP				0		
1971	METHANE, COMPRESSED or NATURAL GAS, COMPRESSED with high methane content	2	1F	2.1		LQ0 E0	PP, EX, A	VE01			1		
1972	METHANE, REFRIGERATED LIQUID or NATURAL GAS, REFRIGERATED LIQUID with high methane content	2	3F	2.1		LQ0 E0	PP, EX, A	VE01			1		

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1973	CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE with fixed boiling point, with approximately 49% chlorodifluoromethane (REFRIGERANT GAS R 502)	2	2A		2,2		LQ1 E1		PP			0	
1974	CHLORODIFLUOROBROMOMETHANE (REFRIGERANT GAS R 12B1)	2	2A		2,2		LQ1 E1		PP			0	
1975	NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURE (NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURE)	2	2TOC		2,3+5,1+8		LQ0 E0		PP, EP, TOX, A	VE02		2	
1976	OCTAFLUOROCYCLOBUTANE (REFRIGERANT GAS RC 318)	2	2A		2,2		LQ1 E1		PP			0	
1977	NITROGEN, REFRIGERATED LIQUID	2	3A		2,2	593	LQ1 E1		PP			0	
1978	PROPANE	2	2F		2,1		LQ0 E0	T	PP, EX, A	VE01		1	
1982	TETRAFLUOROMETHANE (REFRIGERANT GAS R 14)	2	2A		2,2		LQ1 E1		PP			0	
1983	1-CHLORO-2,2-TRIFLUOROETHANE (REFRIGERANT GAS R 133a)	2	2A		2,2		LQ1 E1		PP			0	
1984	TRIFLUOROMETHANE (REFRIGERANT GAS R 23)	2	2A		2,2		LQ1 E1		PP			0	
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	FT1	I	3+6.1	274 802	LQ0 E0	T	PP, EP, EX, TOX, A	VE01, VE02		2	
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	FT1	II	3+6.1	274 802	LQ0 E2	T	PP, EP, EX, TOX, A	VE01, VE02		2	
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	FT1	III	3+6.1	274 802	LQ7 E1	T	PP, EP, EX, TOX, A	VE01, VE02		0	
1987	ALCOHOLS, N.O.S. (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	274 601 640C	LQ4 E2	T	PP, EX, A	VE01		1	
1987	ALCOHOLS, N.O.S. (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	274 601 640D	LQ4 E2	T	PP, EX, A	VE01		1	
1987	ALCOHOLS, N.O.S.	3	F1	III	3	274 601	LQ7 E1	T	PP, EX, A	VE01		0	
1988	ALDEHYDES, FLAMMABLE, TOXIC, N.O.S.	3	FT1	I	3+6.1	274 802	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
1988	ALDEHYDES, FLAMMABLE, TOXIC, N.O.S.	3	FT1	II	3+6.1	274 802	LQ0 E2		PP, EP, EX, TOX, A	VE01, VE02		2	
1988	ALDEHYDES, FLAMMABLE, TOXIC, N.O.S.	3	FT1	III	3+6.1	274 802	LQ7 E1		PP, EP, EX, TOX, A	VE01, VE02		0	
1989	ALDEHYDES, N.O.S.	3	F1	I	3	274 601	LQ3 E3		PP, EX, A	VE01		1	
1989	ALDEHYDES, N.O.S. (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	274 640C	LQ4 E2	T	PP, EX, A	VE01		1	
1989	ALDEHYDES, N.O.S. (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	274 640D	LQ4 E2	T	PP, EX, A	VE01		1	
1989	ALDEHYDES, N.O.S.	3	F1	III	3	274 640D	LQ7 E1	T	PP, EX, A	VE01		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1990	BENZALDEHYDE	9	M11	III	9	802	LQ28	E1	PP	VE01,		0	
1991	CHLOROPRENE, STABILIZED	3	FT1	I	3+6.1	802	LQ0	E0	PP, EP, EX, TOX, A	VE02		2	
1992	FLAMMABLE LIQUID, TOXIC, N.O.S.	3	FT1	I	3+6.1	274	LQ0	E0	PP, EP, EX, TOX, A	VE01,		2	
1992	FLAMMABLE LIQUID, TOXIC, N.O.S.	3	FT1	II	3+6.1	802	LQ0	E2	PP, EP, EX, TOX, A	VE02		2	
1992	FLAMMABLE LIQUID, TOXIC, N.O.S.	3	FT1	III	3+6.1	802	LQ7	E1	PP, EP, EX, TOX, A	VE01,		0	
1993	FLAMMABLE LIQUID, N.O.S.	3	F1	I	3	802	LQ3	E3	PP, EX, A	VE02		1	
1993	FLAMMABLE LIQUID, N.O.S. (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	274	LQ4	E2	PP, EX, A	VE01		1	
1993	FLAMMABLE LIQUID, N.O.S. (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	274	LQ4	E2	PP, EX, A	VE01		1	
1993	FLAMMABLE LIQUID, N.O.S.	3	F1	III	3	274	LQ7	E1	PP, EX, A	VE01		0	
1993	FLAMMABLE LIQUID, N.O.S. (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (boiling point not more than 35 °C)	3	F1	III	3	274	LQ7	E1	PP, EX, A	VE01		0	
1993	FLAMMABLE LIQUID, N.O.S. (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C more than 110 kPa, boiling point of more than 35 °C)	3	F1	III	3	274	LQ7	E1	PP, EX, A	VE01		0	
1993	FLAMMABLE LIQUID, N.O.S. (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3	274	LQ7	E1	PP, EX, A	VE01		0	
1994	IRON PENTACARBONYL	6.1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01,		2	
1999	TARS, LIQUID, including road asphalt and oils, bitumen and cut backs (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	640C	LQ6	E2	PP, EX, A	VE01		1	
1999	TARS, LIQUID, including road asphalt and oils, bitumen and cut backs (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	640D	LQ6	E2	PP, EX, A	VE01		1	
1999	TARS, LIQUID, including road asphalt and oils, bitumen and cut backs	3	F1	III	3	640E	LQ7	E1	PP, EX, A	VE01		0	
1999	TARS, LIQUID, including road asphalt and oils, bitumen and cut backs (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (boiling point not more than 35 °C)	3	F1	III	3	640F	LQ7	E1	PP, EX, A	VE01		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
1999	TARS, LIQUID, including road asphalt and oils, bitumen and cut backs (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C more than 110 kPa, boiling point of more than 35° C)	3	F1	III	3	640G	LQ7 E1		PP, EX, A	VE01		0	
1999	TARS, LIQUID, including road asphalt and oils, bitumen and cut backs (having a flash-point below 23 °C and viscous according to 2.2.3.1.4) (vapour pressure at 50 °C not more than 110 kPa)	3	F1	III	3	640H	LQ7 E1		PP, EX, A	VE01		0	
2000	CELLULOSE in block, rods, rolls, sheets, tubes, etc., except scrap	4,1	F1	III	4,1	502	LQ9 E1		PP			0	
2001	COBALT NAPHTHENATES, POWDER	4,1	F3	III	4,1		LQ9 E1		PP			0	
2002	CELLULOSE, SCRAP	4,2	S2	III	4,2	526 592	LQ0 E1		PP			0	
2004	MAGNESIUM DIAMIDE	4,2	S4	II	4,2		LQ0 E2		PP			0	
2006	PLASTICS, NITROCELLULOSE-BASED, SELF HEATING, N.O.S.	4,2	S2	III	4,2	274 528	LQ0 E1		PP			0	
2008	ZIRCONIUM POWDER, DRY	4,2	S4	I	4,2	524 540	LQ0 E0		PP			0	
2008	ZIRCONIUM POWDER, DRY	4,2	S4	II	4,2	524 540	LQ0 E2		PP			0	
2008	ZIRCONIUM POWDER, DRY	4,2	S4	III	4,2	524 540	LQ0 E1		PP			0	
2009	ZIRCONIUM, DRY, finished sheets, strip or coiled wire	4,2	S4	III	4,2	524 592	LQ0 E1		PP			0	
2010	MAGNESIUM HYDRIDE	4,3	W2	I	4,3		LQ0 E0		PP, EX, A	VE01	HA08	0	
2011	MAGNESIUM PHOSPHIDE	4,3	WT2	I	4.3+6.1	802	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02	HA08	2	
2012	POTASSIUM PHOSPHIDE	4,3	WT2	I	4.3+6.1	802	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02	HA08	2	
2013	STRONTIUM PHOSPHIDE	4,3	WT2	I	4.3+6.1	802	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02	HA08	2	
2014	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)	5,1	OC1	II	5.1+8		LQ10 E2	T	PP, EP			0	
2015	HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED with more than 70% hydrogen peroxide	5,1	OC1	I	5.1+8	640N	LQ0 E0		PP, EP			0	
2015	HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED with more than 60% hydrogen peroxide and not more than 70% hydrogen peroxide	5,1	OC1	I	5.1+8	640O	LQ0 E0		PP, EP			0	
2016	AMMUNITION, TOXIC, NON-EXPLOSIVE without burster or expelling charge, non-fuzed	6,1	T2	II	6,1	802	LQ0 E0		PP, EP			2	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
2017	3.1.2 (2) AMMUNITION, TEAR-PRODUCING, NON-EXPLOSIVE without booster or expelling charge, non-flized	6,1	TC2	II	6,1+8	802	LQ0	E0	PP, EP			2	
2018	CHLOROANILINES, SOLID	6,1	T2	II	6,1	802	LQ18	E4	PP, EP			2	
2019	CHLOROANILINES, LIQUID	6,1	T1	II	6,1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2020	CHLOROPHENOLS, SOLID	6,1	T2	III	6,1	205 802	LQ9	E1	PP, EP			0	
2021	CHLOROPHENOLS, LIQUID	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2022	CRESYLIC ACID	6,1	TC1	II	6,1+8	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2023	EPICHLOROHYDRIN	6,1	TF1	II	6,1+3	279 802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
2024	MERCURY COMPOUND, LIQUID, N.O.S.	6,1	T4	I	6,1	43 274 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
2024	MERCURY COMPOUND, LIQUID, N.O.S.	6,1	T4	II	6,1	43 274 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2024	MERCURY COMPOUND, LIQUID, N.O.S.	6,1	T4	III	6,1	43 274 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2025	MERCURY COMPOUND, SOLID, N.O.S.	6,1	T5	I	6,1	43 274 529 585 802	LQ0	E5	PP, EP			2	
2025	MERCURY COMPOUND, SOLID, N.O.S.	6,1	T5	II	6,1	43 274 29 585 802	LQ18	E4	PP, EP			2	
2025	MERCURY COMPOUND, SOLID, N.O.S.	6,1	T5	III	6,1	43 274 529 585 802	LQ9	E1	PP, EP			0	
2026	PHENYLMERCURIC COMPOUND, N.O.S.	6,1	T3	I	6,1	43 274 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
2026	PHENYLMERCURIC COMPOUND, N.O.S.	6,1	T3	II	6,1	43 274 802	LQ18	E4	PP, EP, TOX, A	VE02		2	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
2026	3.1.2 (2) PHENYLMERCURIC COMPOUND, N.O.S.	2.2 (3a) 6,1	2.2 (3b) T3	2.1.1.3 (4) III	5.2.2 (5) 6,1	3.3 (6) 43 274 802	3.4.6 (7a) LQ9 E1	3.2.1 (8)	8.1.5 (9) PP, EP, TOX, A	7.1.6 (10) VE02	7.1.6 (11)	7.1.5 (12) 0	3.2.1 (13)
2027	SODIUM ARSENITE, SOLID	6,1	T5	II	6,1	43 802	LQ18 E4		PP, EP			2	
2028	BOMBS, SMOKE, NON-EXPLOSIVE with corrosive liquid, without initiating device	8	C11	II	8		LQ0 E0		PP, EP			0	
2029	HYDRAZINE, ANHYDROUS	8	CFT	I	8+3+6.1	802	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2030	HYDRAZINE AQUEOUS SOLUTION, with more than 37% hydrazine by mass, having a flash-point above 60 °C	8	CT1	I	8+6.1	530 802	LQ0 E0		PP, EP, TOX, A	VE02		2	
2030	HYDRAZINE AQUEOUS SOLUTION, with more than 37% hydrazine by mass having a flash-point of not more than 60 °C	8	CFT	I	8 3 6.1	530 802	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2030	HYDRAZINE AQUEOUS SOLUTION, with more than 37% hydrazine by mass	8	CT1	II	8+6.1	530 802	LQ22 E2		PP, EP, TOX, A	VE02		2	
2030	HYDRAZINE AQUEOUS SOLUTION, with more than 37% hydrazine by mass	8	CT1	III	8+6.1	530 802	LQ7 E1		PP, EP, TOX, A	VE02		0	
2031	NITRIC ACID, other than red fuming, with more than 70% nitric acid	8	CO1	I	8+5.1		LQ0 E0	T	PP, EP			0	
2031	NITRIC ACID, other than red fuming, with at least 65%, but not more than 70% nitric acid	8	CO1	II	8+5.1		LQ22 E2	T	PP, EP			0	
2031	NITRIC ACID, other than red fuming, with less than 65% nitric acid	8	C1	II	8		LQ22 E2	T	PP, EP			0	
2032	NITRIC ACID, RED FUMING	8	COT	I	8+5.1+6.1	802	LQ0 E0	T	PP, EP, TOX, A	VE02		2	
2033	POTASSIUM MONOXIDE	8	C6	II	8		LQ23 E2		PP, EP			0	
2034	HYDROGEN AND METHANE MIXTURE, COMPRESSED	2	1F		2,1		LQ0 E0		PP, EX, A	VE01		1	
2035	1,1,1-TRIFLUOROETHANE (REFRIGERANT GAS R 143a)	2	2F		2,1		LQ0 E0		PP, EX, A	VE01		1	
2036	XENON	2	2A		2,2		LQ1 E1		PP			0	
2037	RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) without a release device, non-refillable	2	5A		2,2	191 303	LQ2 E0		PP			0	
2037	RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) without a release device, non-refillable	2	5F		2,1	191 303	LQ2 E0		PP, EX, A	VE01		1	
2037	RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) without a release device, non-refillable	2	5O		2.2+5.1	191 303	LQ2 E0		PP			0	
2037	RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) without a release device, non-refillable	2	5T		2,3	303	LQ1 E0		PP, EP, TOX, A	VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2037	RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) without a release device, non-refillable	2	5TC		2.3+8	303	LQ1	E0	PP, EP, TOX, A	VE02		2	
2037	RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) without a release device, non-refillable	2	5TF		2.3+2.1	303	LQ1	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
2037	RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) without a release device, non-refillable	2	5TFC		2.3+2.1+8	303	LQ1	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
2037	RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) without a release device, non-refillable	2	5TO		2.3+5.1	303	LQ1	E0	PP, EP, TOX, A	VE02		2	
2037	RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) without a release device, non-refillable	2	5TOC		2.3+5.1+8	303	LQ1	E0	PP, EP, TOX, A	VE02		2	
2038	DINITROTOLUENES, LIQUID	6,1	T1	II	6,1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2044	2,2-DIMETHYLPROPANE	2	2F		2,1		LQ0	E0	PP, EX, A	VE01		1	
2045	ISOBUTYRALDEHYDE (ISOBUTYL ALDEHYDE)	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2046	CYMENES	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2047	DICHLOROPROPENES	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2047	DICHLOROPROPENES	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2048	DICYCLOPENTADIENE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2049	DIETHYLBENZENE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2050	DIISOBUTYLENE, ISOMERIC COMPOUNDS	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2051	2-DIMETHYLAMINOETHANOL	8	CF1	II	8+3		LQ22	E2	PP, EP, EX, A	VE01		1	
2052	DIPENTENE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2053	METHYL ISOBUTYL CARBINOL	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2054	MORPHOLINE	8	CF1	I	8+3		LQ0	E0	PP, EP, EX, A	VE01		1	
2055	STYRENE MONOMER, STABILIZED	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2056	TETRAHYDROFURAN	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2057	TRIPROPYLENE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2057	TRIPROPYLENE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2058	VALERALDEHYDE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2059	NITROCELLULOSE SOLUTION, FLAMMABLE with not more than 12.6% nitrogen, by dry mass, and not more than 55% nitrocellulose	3	D	I	3	198 531	LQ3	E0	PP, EX, A	VE01		1	
2059	NITROCELLULOSE SOLUTION, FLAMMABLE with not more than 12.6% nitrogen, by dry mass, and not more than 55% nitrocellulose (vapour pressure at 50 °C more than 110 kPa)	3	D	II	3	198 531 640C	LQ4	E0	PP, EX, A	VE01		1	

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(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a) (7b)	(8)	(9)	(10)	(11)	(12)	(13)	
2059	NITROCELLULOSE SOLUTION, FLAMMABLE with not more than 12.6% nitrogen, by dry mass, and not more than 55% nitrocellulose (vapour pressure at 50 °C not more than 110 kPa)	3	D	II	3	198 531 640D	LQ4 E0		PP, EX, A	VE01		1		
2059	NITROCELLULOSE SOLUTION, FLAMMABLE with not more than 12.6% nitrogen, by dry mass, and not more than 55% nitrocellulose	3	D	III	3	198 531	LQ7 E0		PP, EX, A	VE01		0		
2067	AMMONIUM NITRATE BASED FERTILIZER	5.1	O2	III	5.1	186 306 307	LQ12 E1	B	PP		CO02, ST01, LO04 HA09	0	CO02, LO04 and HA09 apply only when this substance is carried in bulk or without packaging	
2071	Ammonium nitrate based fertilizers, uniform mixtures of the nitrogen/phosphate, nitrogen/potash or nitrogen/phosphate/potash type, containing not more than 70% ammonium nitrate and not more than 0.4% total combustible/organic material calculated as carbon or with not more than 45% ammonium nitrate and unrestricted combustible material	9	M11		2,2	186 193	LQ1 E1	B	PP		CO02, ST02 HA09	0	Dangerous only in bulk or without packaging. CO02, ST02 and HA09 apply only when this substance is carried in bulk or without packaging	
2073	AMMONIA SOLUTION, relative density less than 0.880 at 15 °C in water, with more than 35% but not more than 50% ammonia	2	4A			532	LQ1 E1		PP			0		
2074	ACRYLAMIDE, SOLID	6.1	T2	III	6.1	802	LQ9 E1	T	PP, EP			0		
2075	CHLORAL, ANHYDROUS, STABILIZED	6.1	T1	II	6.1	802	LQ17 E4		PP, EP, TOX, A	VE02		2		
2076	CRESOLS, LIQUID	6.1	TC1	II	6.1+8	802	LQ17 E4		PP, EP, TOX, A	VE02		2		
2077	alpha-NAPHTHYLAMINE	6.1	T2	III	6.1	802	LQ9 E1		PP, EP			0		
2078	TOLUENE DIISOCYANATE	6.1	T1	II	6.1	279 802	LQ17 E4	T*	PP, EP, TOX, A	VE02		2	* only for 2,4-TOLUENE DIISOCYANATE	
2079	DIETHYLENETRIAMINE	8	C7	II	8		LQ22 E2	T	PP, EP			0		
2186	HYDROGEN CHLORIDE, REFRIGERATED LIQUID	2	3TC					CARRIAGE PROHIBITED						
2187	CARBON DIOXIDE, REFRIGERATED LIQUID	2	3A		2,2	593	LQ1 E1		PP			0		
2188	ARSINE	2	2TF		2.3+2.1		LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2		
2189	DICHLOROSILANE	2	2TFC		2.3+2.1+8		LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2		
2190	OXYGEN DIFLUORIDE, COMPRESSED	2	1TOC		2.3+5.1+8		LQ0 E0		PP, EP, TOX, A	VE02		2		

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2191	SULPHURYL FLUORIDE	2	2T		2.3		LQ0	E0	PP, EP, TOX, A	VE02		2	
2192	GERMANE	2	2TF		2.3+2.1	632	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
2193	HEXAFLUOROETHANE (REFRIGERANT GAS R 116)	2	2A		2.2		LQ1	E1	PP			0	
2194	SELENIUM HEXAFLUORIDE	2	2TC		2.3+8		LQ0	E0	PP, EP, TOX, A	VE02		2	
2195	TELLURIUM HEXAFLUORIDE	2	2TC		2.3+8		LQ0	E0	PP, EP, TOX, A	VE02		2	
2196	TUNGSTEN HEXAFLUORIDE	2	2TC		2.3+8		LQ0	E0	PP, EP, TOX, A	VE02		2	
2197	HYDROGEN IODIDE, ANHYDROUS	2	2TC		2.3+8		LQ0	E0	PP, EP, TOX, A	VE02		2	
2198	PHOSPHORUS PENTAFLUORIDE	2	2TC		2.3+8		LQ0	E0	PP, EP, TOX, A	VE02		2	
2199	PHOSPHINE	2	2TF		2.3+2.1	632	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
2200	PROPADIENE, STABILIZED	2	2F		2.1		LQ0	E0	PP, EX, A	VE01		1	
2201	NITROUS OXIDE, REFRIGERATED LIQUID	2	30		2.2+5.1		LQ0	E0	PP			0	
2202	HYDROGEN SELENIDE, ANHYDROUS	2	2TF		2.3+2.1		LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
2203	SILANE	2	2F		2.1	632	LQ0	E0	PP, EX, A	VE01		1	
2204	CARBONYL SULPHIDE	2	2TF		2.3+2.1		LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
2205	ADIPONITRILE	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2206	ISOCYANATES, TOXIC, N.O.S. or ISOCYANATE SOLUTION, TOXIC, N.O.S.	6,1	T1	II	6,1	274 551 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2206	ISOCYANATES, TOXIC, N.O.S. or ISOCYANATE SOLUTION, TOXIC, N.O.S.	6,1	T1	III	6,1	274 551 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2208	CALCIUM HYPOCHLORITE MIXTURE, DRY with more than 10% but not more than 39% available chlorine	5,1	O2	III	5,1	313 314	LQ12	E1	PP			0	
2209	FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	8	C9	III	8	533	LQ7	E1	PP, EP			0	
2210	MANEB or MANEB PREPARATION with not less than 60% maneb	4,2	SW	III	4.2+4.3	273	LQ0	E1	PP, EX, A	VE01, VE03	IN01, IN03	0	VE03, IN01 and IN03 apply only when this substance is carried in bulk or without packaging

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(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
2211	POLYMERIC BEADS, EXPANDABLE, evolving flammable vapour	9	M3	III	none	207 633	LQ27 E1	B	PP, EX, EP, A	VE01, VE03	IN01	0	VE03 and IN01 apply only when this substance is carried in bulk or without packaging
2212	BLUE ASBESTOS (crocidolite) or BROWN ASBESTOS (amosite, mrysorite)	9	M1	II	9	168 802	LQ25 E2		PP			0	
2213	PARAFORMALDEHYDE	4.1	F1	III	4.1		LQ9 E1		PP			0	
2214	PHTHALIC ANHYDRIDE with more than 0.05% of maleic anhydride	8	C4	III	8	169	LQ24 E1		PP, EP			0	
2215	MALEIC ANHYDRIDE, MOL.TEN	8	C3	III	8		LQ0 E0	T	PP, EP			0	
2215	MALEIC ANHYDRIDE	8	C4	III	8		LQ24 E1		PP, EP			0	
2216	FISH MEAL, STABILISED or FISH SCRAP, STABILISED	9	M11					B	PP			0	
2217	SEED CAKE with not more than 1.5% oil and not more than 11% moisture	4.2	S2	III	4.2	142 800	LQ0 E1	B	PP		IN01	0	IN01 applies only when this substance is carried in bulk or without packaging
2218	ACRYLIC ACID, STABILIZED	8	CF1	II	8+3		LQ22 E2	T	PP, EP, EX, A	VE01		1	
2219	ALLYL GLYCIDYL ETHER	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2222	ANISOLE	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2224	BENZONITRILE	6.1	T1	II	6.1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
2225	BENZENESULPHONYL CHLORIDE	8	C3	III	8		LQ7 E1		PP, EP			0	
2226	BENZOTRICHLORIDE	8	C9	II	8		LQ22 E2		PP, EP			0	
2227	n-BUTYL METHACRYLATE, STABILIZED	3	F1	III	3		LQ7 E1	T	PP, EX, A	VE01		0	
2232	2-CHLOROETHANAL	6.1	T1	I	6.1	802	LQ0 E5		PP, EP, TOX, A	VE02		2	
2233	CHLOROANISIDINES	6.1	T2	III	6.1	802	LQ9 E1		PP, EP			0	
2234	CHLOROBENZOTRIFLUORIDES	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2235	CHLOROBENZYL CHLORIDES, LIQUID	6.1	T1	III	6.1	802	LQ7 E1		PP, EP			0	
2236	3-CHLORO-4-METHYLPHENYL ISOCYANATE, LIQUID	6.1	T1	II	6.1	802	LQ17 E4		PP, EP			2	
2237	CHLORONITROANILINES	6.1	T2	III	6.1	802	LQ9 E1		PP, EP			0	
2238	CHLOROTOLUENES	3	F1	III	3		LQ7 E1	T	PP, EX, A	VE01		0	
2239	CHLOROTOLUIDINES, SOLID	6.1	T2	III	6.1	802	LQ9 E1		PP, EP			0	
2240	CHROMOSULPHURIC ACID	8	C1	I	8		LQ0 E0		PP, EP			0	
2241	CYCLOHEPTANE	3	F1	II	3		LQ4 E2	T	PP, EX, A	VE01		1	
2242	CYCLOHEPTENE	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
2243	CYCLOHEXYL ACETATE	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2244	CYCLOPENTANOL	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2245	CYCLOPENTANONE	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2246	CYCLOPENTENE	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
2247	n-DECANE	3	F1	III	3		LQ7 E1	T	PP, EX, A	VE01		0	
2248	DI-n-BUTYLAMINE	8	CF1	II	8+3		LQ22 E2	T	PP, EP, EX, A	VE01		1	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(7b)	(9)	(10)	(11)	(12)	(13)
CARRIAGE PROHIBITED													
2249	DICHLORODIMETHYL ETHER, SYMMETRICAL	6,1	TF1										
2250	DICHLOROPHENYL ISOCYANATES	6,1	T2	II	6,1	802	LQ17	E4	PP, EP			2	
2251	BICYCLO[2.2.1]HEPTA-2-5-DIENE, STABILIZED (2,5-NORBORNADIENE, STABILIZED)	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2252	1,2-DIMETHOXYETHANE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2253	N,N-DIMETHYLANILINE	6,1	T1	II	6,1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2254	MATCHES, FUSEE	4,1	F1	III	4,1	293	LQ9	E1	PP			0	
2256	CYCLOHEXENE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2257	POTASSIUM	4,3	W2	I	4,3		LQ0	E0	PP, EX, A	VE01	HA08	0	
2258	1,2-PROPYLENEDIAMINE	8	CF1	II	8+3		LQ22	E2	PP, EP, EX, A	VE01		1	
2259	TRIMETHYLENETETRAMINE	8	C7	II	8		LQ22	E2	PP, EP			0	
2260	TRIPROPYLAMINE	3	FC	III	3+8		LQ7	E1	PP, EP, EX, A	VE01		0	
2261	XYLENOLS, SOLIE	6,1	T2	III	6,1	802	LQ18	E4	PP, EP			2	
2262	DIMETHYLCARBAMOYL CHLORIDE	8	C3	II	8		LQ22	E2	PP, EP			0	
2263	DIMETHYLCYCLOHEXANES	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2264	N,N-DIMETHYLCYCLOHEXYLAMINE	8	CF1	II	8+3		LQ22	E2	T			1	
2265	N,N-DIMETHYLFORMAMIDE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2266	DIMETHYL-N-PROPYLAMINE	3	FC	II	3+8		LQ4	E2	T			1	
2267	DIMETHYL THIOPHOSPHORYL CHLORIDE	6,1	TC1	II	6,1+8	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2269	3,3'-IMINODIPROPYLAMINE	8	C7	III	8		LQ7	E1	PP, EP			0	
2270	ETHYLAMINE, AQUEOUS SOLUTION with not less than 50% but not more than 70% ethylamine	3	FC	II	3+8		LQ4	E2	PP, EP, EX, A	VE01		1	
2271	ETHYL AMYL KETONE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2272	N-ETHYLANILINE	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2273	2-ETHYLANILINE	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2274	N-ETHYL-N-BENZYLANILINE	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2275	2-ETHYLBUTANOL	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2276	2-ETHYLHEXYLAMINE	3	FC	III	3+8		LQ7	E1	PP, EP, EX, A	VE01		0	
2277	ETHYL METHACRYLATE, STABILIZED	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2278	n-HEPTENE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2279	HEXACHLOROBUTADIENE	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2280	HEXAMETHYLENEDIAMINE, SOLIL	8	C8	III	8		LQ24	E1	PP, EP			0	
2281	HEXAMETHYLENE DIISOCYANATE	6,1	T1	II	6,1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2282	HEXANOLS	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2283	ISOBUTYL METHACRYLATE, STABILIZED	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2284	ISOBUTYRONITRILE	3	FT1	II	3+6.1	802	LQ0	E2	PP, EP, EX, TOX, A	VE01, VE02		2	
2285	ISOCYANATO BENZOTRIFLUORIDES	6,1	TF1	II	6.1+3	802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
2286	PENTAMETHYLHEPTANE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2287	ISOHEPTENES	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2288	ISOHEXENES	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2289	ISOPHORONEDIAMINE	8	C7	III	8		LQ7	E1	PP, EP			0	
2290	ISOPHORONE DIISOCYANATE	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2291	LEAD COMPOUND, SOLUBLE, N.O.S.	6,1	T5	III	6,1	199 274 535 802	LQ9	E1	PP, EP			0	
2293	4-METHOXY-4-METHYLPENTAN-2-ONE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2294	N-METHYLANILINE	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2295	METHYL CHLOROACETATE	6,1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2296	METHYLCYCLOHEXANE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2297	METHYLCYCLOHEXANONE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2298	METHYLCYCLOPENTANE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2299	METHYL DICHLOROACETATE	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2300	2-METHYL-5-ETHYLPYRIDINE	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2301	2-METHYLFURAN	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2302	5-METHYLHEXAN-2-ONE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2303	ISOPROPENYLBENZENE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2304	NAPHTHALENE, MOLTEN	4,1	F2	III	4,1	536	LQ0	E0	PP			0	
2305	NITROBENZENESULPHONIC ACID	8	C4	II	8		LQ23	E2	PP, EP			0	
2306	NITROBENZOTRIFLUORIDES, LIQUID	6,1	T1	II	6,1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2307	3-NITRO-4-CHLOROBENZOTRIFLUORIDE	6,1	T1	II	6,1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2308	NITROSYLSULPHURIC ACID, LIQUID	8	C1	II	8		LQ22	E2	PP, EP			0	
2309	OCTADIENE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2310	PENTANE-2,4-DIONE	3	FT1	III	3+6.1	802	LQ7	E1	PP, EP, EX, TOX, A	VE01, VE02		0	
2311	PHENETIDINES	6,1	T1	III	6,1	279 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2312	PHENOL, MOLTEN	6,1	T1	II	6,1	802	LQ0	E0	PP, EP, TOX, A	VE02		2	
2313	PICOLINES	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2315	POLYCHLORINATED BIPHENYLS, LIQUID	9	M2	II	9	305 802	LQ26	E2	PP, EP			0	

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(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
				2.1.1.3	5.2.2	3.3	3.4.6	3.2.1	8.1.5	7.1.6	7.1.6	7.1.5	
							3.5.1.2						
							(7b)						
2316	SODIUM CUPROCYANIDE, SOLID	6,1	T5	I	6,1	802	LQ0	E5	PP, EP			2	
2317	SODIUM CUPROCYANIDE SOLUTION	6,1	T4	I	6,1	802	LQ0	E5	PP, EP			2	
2318	SODIUM HYDROSULPHIDE with less than 25% water of crystallization	4,2	S4	II	4,2	504	LQ0	E2	PP			0	
2319	TERPENE HYDROCARBONS, N.O.S.	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2320	TETRAETHYLENEPENTAMINE	8	C7	III	8		LQ7	E1	PP, EP			0	
2321	TRICHLOROBENZENES, LIQUID	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2322	TRICHLOROBUTENE	6,1	T1	II	6,1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2323	TRIETHYL PHOSPHITE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2324	TRISOBUTYLENE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2325	1,3,5-TRIMETHYLBENZENE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2326	TRIMETHYLCYCLOHEXYLAMINE	8	C7	III	8		LQ7	E1	PP, EP			0	
2327	TRIMETHYLHEXAMETHYLENEDIAMINES	8	C7	III	8		LQ7	E1	PP, EP			0	
2328	TRIMETHYLHEXAMETHYLENE DIISOCYANATE	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2329	TRIMETHYL PHOSPHITE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2330	UNDECANE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2331	ZINC CHLORIDE, ANHYDROUS	8	C2	III	8		LQ24	E1	PP, EP			0	
2332	ACETALDEHYDE OXIME	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2333	ALLYL ACETATE	3	FT1	II	3+6.1	802	LQ0	E2	PP, EP, EX, TOX, A	VE01, VE02		2	
2334	ALLYLAMINE	6,1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2335	ALLYL ETHYL ETHER	3	FT1	II	3+6.1	802	LQ0	E2	PP, EP, EX, TOX, A	VE01, VE02		2	
2336	ALLYL FORMATE	3	FT1	I	3+6.1	802	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
2337	PHENYL MERCAPTAN	6,1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2338	BENZOTRIFLUORIDE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2339	2-BROMOBUTANE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2340	2-BROMOETHYL ETHER	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2341	1-BROMO-3-METHYLBUTANE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2342	BROMOMETHYLPROPANES	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2343	2-BROMOPENTANE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2344	BROMOPROPANES	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2344	BROMOPROPANES	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2345	3-BROMOPROPYNE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2346	BUTANEDIONE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2347	BUTYL MERCAPTAN	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2348	BUTYL ACRYLATES, STABILIZED	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2350	BUTYL METHYL ETHER	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2351	BUTYL NITRITES	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2351	BUTYL NITRITES	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loadings, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2352	BUTYL VINYL ETHER, STABILIZED	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2353	BUTYRYL CHLORIDE	3	FC	II	3+8		LQ4		PP, EP, EX, A	VE01		1	
2354	CHLOROMETHYL ETHYL ETHER	3	FT1	II	3+6.1	802	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
2356	2-CHLOROPROPANE	3	FI	I	3		LQ3	T	PP, EX, A	VE01		1	
2357	CYCLOHEXYLAMINE	8	CF1	II	8+3		LQ22	T	PP, EP, EX, A	VE01		1	
2358	CYCLOOCTATETRAENE	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2359	DIALLYLAMINE	3	FTC	II	3+6.1+8	802	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
2360	DIALLYL ETHER	3	FT1	II	3+6.1	802	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
2361	DIISOBUTYLAMINE	3	FC	III	3+8		LQ7		PP, EP, EX, A	VE01		0	
2362	1,1-DICHLOROETHANE	3	FI	II	3		LQ4	T	PP, EX, A	VE01		1	
2363	ETHYL MERCAPTAN	3	FI	I	3		LQ3		PP, EX, A	VE01		1	
2364	n-PROPYLBENZENE	3	FI	III	3		LQ7		PP, EX, A	VE01		0	
2366	DIETHYL CARBONATE	3	FI	III	3		LQ7		PP, EX, A	VE01		0	
2367	alpha-METHYLALERALDEHYDE	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2368	alpha-PINENE	3	FI	III	3		LQ7		PP, EX, A	VE01		0	
2370	1-HEXENE	3	FI	I	3		LQ4	T	PP, EX, A	VE01		1	
2371	ISOPENTENES	3	FI	I	3		LQ3		PP, EX, A	VE01		1	
2372	1,2-DI-(DIMETHYLAMINO) ETHANE	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2373	DIETHOXYMETHANE	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2374	3,3-DIETHOXYPROPENE	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2375	DIETHYL SULPHIDE	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2376	2,3-DIHYDROPIRAN	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2377	1,1-DIMETHOXYETHANE	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2378	2-DIMETHYLAMINOACETONITRILE	3	FT1	II	3+6.1	802	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
2379	1,3-DIMETHYLBUTYLAMINE	3	FC	II	3+8		LQ4		PP, EP, EX, A	VE01		1	
2380	DIMETHYLDIETHOXYSILOANE	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2381	DIMETHYL DISULPHIDE	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2382	DIMETHYLHYDRAZINE, SYMMETRICAL	6.1	TF1	I	6.1+3	802	LQ0	T	PP, EP, EX, TOX, A	VE01, VE02		2	
2383	DIPROPYLAMINE	3	FC	II	3+8		LQ4	T	PP, EP, EX, A	VE01		1	
2384	DI-n-PROPYL ETHER	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2385	ETHYL ISOBUTYRATE	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2386	1-ETHYLPYPERIDINE	3	FC	II	3+8		LQ4		PP, EP, EX, A	VE01		1	
2387	FLUOROBENZENE	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2388	FLUOROTOLUENES	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2389	FURAN	3	FI	I	3		LQ3		PP, EX, A	VE01		1	
2390	2-iodobutane	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2391	iodomethylpropanes	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2392	iodopropanes	3	FI	III	3		LQ7		PP, EX, A	VE01		0	
2393	isobutyl formate	3	FI	II	3		LQ4		PP, EX, A	VE01		1	
2394	isobutyl propionate	3	FI	III	3		LQ7		PP, EX, A	VE01		0	
2395	isobutyryl chloride	3	FC	II	3+8		LQ4		PP, EP, EX, A	VE01		1	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a) 3.4.6 3.5.1.2	(8)	(9)	(10)	(11)	(12)	(13)
2396	METHACRYLALDEHYDE, STABILIZED	2,2	FT1	II	3+6.1	802	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	3.2.1 (13)
2397	3-METHYLBUTAN-2-ONE	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
2398	METHYL tet-BUTYL ETHER	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
2399	1-METHYLPYRIDINE	3	FC	II	3+8		LQ4		PP, EP, EX, A	VE01		1	
2400	METHYL ISOVALERATE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
2401	PIPERIDINE	8	CF1	I	8+3		LQ0		PP, EP, EX, A	VE01		1	
2402	PROPANETHIOLS	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
2403	ISOPROPENYL ACETATE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
2404	PROPIONITRILE	3	FT1	II	3+6.1	802	LQ0	T	PP, EP, EX, TOX, A	VE01, VE02		2	
2405	ISOPROPYL BUTYRATE	3	F1	III	3		LQ7		PP, EX, A	VE01		0	
2406	ISOPROPYL ISOBUTYRATE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
2407	ISOPROPYL CHLOROFORMATE	6,1	TFC	I	6.1+3+8	802	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
2409	ISOPROPYL PROPIONATE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
2410	1,2,3,6-TETRAHYDROPIRIDINE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
2411	BUTYRONITRILE	3	FT1	II	3+6.1	802	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
2412	TETRAHYDROTHIOPHENE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
2413	TETRAPROPYL ORTHOTITANATE	3	F1	III	3		LQ7		PP, EX, A	VE01		0	
2414	THIOPHENE	3	F1	II	3		LQ4	T	PP, EX, A	VE01		1	
2416	TRIMETHYL BORATE	3	F1	II	3		LQ4		PP, EX, A	VE01		1	
2417	CARBONYL FLUORIDE	2	2TC		2.3+8		LQ0		PP, EP, TOX, A	VE02		2	
2418	SULPHUR TETRAFLUORIDE	2	2TC		2.3+8		LQ0		PP, EP, TOX, A	VE02		2	
2419	BROMOTRIFLUOROETHYLENE	2	2F		2.1		LQ0		PP, EX, A	VE01		1	
2420	HEXAFLUOROACETONE	2	2TC		2.3+8		LQ0		PP, EP, TOX, A	VE02		2	
2421	NITROGEN TRIOXIDE	2	2TOC						A				
2422	OCTAFLUOROBUT-2-ENE (REFRIGERANT GAS R. 1318)	2	2A		2,2		LQ1	E1	PP			0	
2424	OCTAFLUOROPROPANE (REFRIGERANT GAS R. 218)	2	2A		2,2		LQ1	E1	PP			0	
2426	AMMONIUM NITRATE, LIQUID, hot concentrated solution, in a concentration of more than 80% but not more than 93%	5,1	O1		5,1	252 644	LQ0	E0	PP			0	
2427	POTASSIUM CHLORATE, AQUEOUS SOLUTION	5,1	O1	II	5,1		LQ10	E2	PP			0	
2427	POTASSIUM CHLORATE, AQUEOUS SOLUTION	5,1	O1	III	5,1		LQ13	E1	PP			0	
2428	SODIUM CHLORATE, AQUEOUS SOLUTION	5,1	O1	II	5,1		LQ10	E2	PP			0	
2428	SODIUM CHLORATE, AQUEOUS SOLUTION	5,1	O1	III	5,1		LQ13	E1	PP			0	

CARRIAGE PROHIBITED

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
2429	CALCIUM CHLORATE, AQUEOUS SOLUTION	5,1	O1	II	5,1		LQ10	E2	PP			0	
2429	CALCIUM CHLORATE, AQUEOUS SOLUTION	5,1	O1	III	5,1		LQ13	E1	PP			0	
2430	ALKYLPHENOLS, SOLID, N.O.S. (including C ₇ , homologues)	8	C4	I	8	274	LQ0	E0	PP, EP			0	
2430	ALKYLPHENOLS, SOLID, N.O.S. (including C ₇ , homologues)	8	C4	II	8	274	LQ23	E2	PP, EP			0	
2430	ALKYLPHENOLS, SOLID, N.O.S. (including C ₇ , homologues)	8	C4	III	8	274	LQ24	E1	PP, EP			0	
2431	ANISIDINES	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2432	N,N-DIETHYLANILINE	6,1	T1	III	6,1	279 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2433	CHLORONITROLUENES, LIQUID	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2434	DIBENZYL-DICHLOROSILANE	8	C3	II	8		LQ22	E2	PP, EP			0	
2435	ETHYLPHENYL-DICHLOROSILANE	8	C3	II	8		LQ22	E2	PP, EP			0	
2436	THIOACETIC ACID	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2437	METHYLPHENYL-DICHLOROSILANE	8	C3	II	8		LQ22	E2	PP, EP			0	
2438	TRIMETHYLACETYL CHLORIDE	6,1	TFC	I	6,1+3+8	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2439	SODIUM HYDROGENDIFLUORIDE	8	C2	II	8		LQ23	E2	PP, EP			0	
2440	TANNIC CHLORIDE PENTAHYDRATE	8	C2	III	8		LQ24	E1	PP, EP			0	
2441	TITANIUM TRICHLORIDE, PYROPHORIC or TITANIUM TRICHLORIDE MIXTURE, PYROPHORIC	4,2	SC4	I	4,2+8	537	LQ0	E0	PP			0	
2442	TRICHLOROACETYL CHLORIDE	8	C3	II	8		LQ22	E2	PP, EP			0	
2443	VANADIUM OXYTRICHLORIDE	8	C1	II	8		LQ22	E2	PP, EP			0	
2444	VANADIUM TETRACHLORIDE	8	C1	I	8		LQ0	E0	PP, EP			0	
2446	NITRORESOLS, SOLID	6,1	T2	III	6,1	802	LQ9	E1	PP, EP			0	
2447	PHOSPHORUS, WHITE, MOLTEN	4,2	ST3	I	4,2+6,1	802	LQ0	E0	PP, EP, TOX, A	VE02		2	
2448	SULPHUR, MOLTEN	4,1	F3	III	4,1	538	LQ0	E0	PP			0	
2451	NITROGEN TRIFLUORIDE	2	20		2,2+5,1		LQ0	E0	PP			0	
2452	ETHYLACETYLENE, STABILIZED	2	2F		2,1		LQ0	E0	PP, EX, A	VE01		0	
2453	ETHYL FLUORIDE (REFRIGERANT GAS R 161)	2	2F		2,1		LQ0	E0	PP, EX, A	VE01		1	
2454	METHYL FLUORIDE (REFRIGERANT GAS R 41)	2	2F		2,1		LQ0	E0	PP, EX, A	VE01		1	
2455	METHYL NITRIDE	2	2A										
2456	2-CHLOROPROPENE	3	F1	I	3		LQ3	E3	PP, EX, A	VE01		1	
2457	2,3-DIMETHYLBUTANE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2458	HEXADIENES	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2459	2-METHYL-1-BUTENE	3	F1	I	3		LQ3	E3	PP, EX, A	VE01		1	
2460	2-METHYL-2-BUTENE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	

CARRIAGE PROHIBITED

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2461	METHYLPENTADIENE	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2463	ALUMINIUM HYDRIDE	4.3	W2	I	4.3		LQ0	E0	PP, EX, A	VE01	HA08	0	
2464	BERYLLIUM NITRATE	5.1	OT2	II	5.1+6.1	802	LQ11	E2	PP			2	
2465	DICHLOROISOCYANURIC ACID, DRY or DICHLOROISOCYANURIC ACID SALTS	5.1	O2	II	5.1	135	LQ11	E2	PP			0	
2466	POTASSIUM SUPEROXIDE	5.1	O2	I	5.1		LQ0	E0	PP			0	
2468	TRICHLOROISOCYANURIC ACID, DRY	5.1	O2	II	5.1		LQ11	E2	PP			0	
2469	ZINC BROMATE	5.1	O2	III	5.1		LQ12	E1	PP			0	
2470	PHENYLACETONITRILE, LIQUID	6.1	T1	III	6.1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2471	OSMIUM TETROXIDE	6.1	T5	I	6.1	802	LQ0	E5	PP, EP			2	
2473	SODIUM ARSANILATE	6.1	T3	III	6.1	802	LQ9	E1	PP, EP, TOX, A	VE02		0	
2474	THIOPHOSGENE	6.1	T1	II	6.1	279 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2475	VANADIUM TRICHLORIDE	8	C2	III	8		LQ24	E1	PP, EP			0	
2477	METHYL ISOTHIOCYANATE	6.1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2478	ISOCYANATES, FLAMMABLE, TOXIC, N.O.S. or ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S	3	FT1	II	3+6.1	274 539 802	LQ0	E2	PP, EP, EX, TOX, A	VE01, VE02		2	
2478	ISOCYANATES, FLAMMABLE, TOXIC, N.O.S. or ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S	3	FT1	III	3+6.1	274 802	LQ7	E1	PP, EP, EX, TOX, A	VE01, VE02		0	
2480	METHYL ISOCYANATE	6.1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2481	ETHYL ISOCYANATE	3	FT1	I	3+6.1	802	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
2482	n-PROPYL ISOCYANATE	6.1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2483	ISOPROPYL ISOCYANATE	3	FT1	I	3+6.1	802	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
2484	tert-BUTYL ISOCYANATE	6.1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2485	n-BUTYL ISOCYANATE	6.1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2486	ISOBUTYL ISOCYANATE	3	FT1	II	3+6.1	802	LQ0	E2	PP, EP, EX, TOX, A	VE01, VE02		2	
2487	PHENYL ISOCYANATE	6.1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2488	CYCLOHEXYL ISOCYANATE	6.1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2490	DICHLOROISOPROPYL ETHER	6.1	T1	II	6.1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2491	ETHANOLAMINE or ETHANOLAMINE SOLUTION	8	C7	III	8		LQ7	E1	PP, EP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2493	HEXAMETHYLENIMINE	3	FC	II	3+8		LQ4	T	PP, EP, EX, A	VE01		1	
2495	IODINE PENTAFLUORIDE	5.1	OTC	I	5.1+6.1+8	802	LQ0		PP, EP, TOX, A	VE02		2	
2496	PROPIONIC ANHYDRIDE	8	C3	III	8		LQ7	T	PP, EP			0	
2498	1,2,3,6-TETRAHYDROBENZALDEHYDE	3	F1	III	3		LQ7		PP, EX, A	VE01		0	
2501	TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE SOLUTION	6.1	T1	II	6.1	802	LQ17		PP, EP, TOX, A	VE02		2	
2501	TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE SOLUTION	6.1	T1	III	6.1	802	LQ7		PP, EP, TOX, A	VE02		0	
2502	VALERYL CHLORIDE	8	CF1	II	8+3		LQ22		PP, EP, EX, A	VE01		1	
2503	ZIRCONIUM TETRACHLORIDE	8	C2	III	8		LQ24		PP, EP			0	
2504	TETRABROMOETHANE	6.1	T1	III	6.1	802	LQ7		PP, EP, TOX, A	VE02		0	
2505	AMMONIUM FLUORIDE	6.1	T5	III	6.1	802	LQ9	B	PP, EP			0	
2506	AMMONIUM HYDROGEN SULPHATE	8	C2	II	8		LQ23	B	PP, EP		CO03	0	CO03 applies only when this substance is carried in bulk or without packaging
2507	CHLOROPLATINIC ACID, SOLID	8	C2	III	8		LQ24		PP, EP			0	
2508	MOLYBDENUM PENTACHLORIDE	8	C2	III	8		LQ24		PP, EP			0	
2509	POTASSIUM HYDROGEN SULPHATE	8	C2	II	8		LQ23	B	PP, EP		CO03	0	CO03 applies only when this substance is carried in bulk or without packaging
2511	2-CHLOROPROPIONIC ACID	8	C3	III	8		LQ7		PP, EP			0	
2512	AMINOPHENOLS (o-, m-, p-)	6.1	T2	III	6.1	279 802	LQ9		PP, EP			0	
2513	BROMOACETYL BROMIDE	8	C3	II	8		LQ22		PP, EP			0	
2514	BROMOBENZENE	3	F1	III	3		LQ7		PP, EX, A	VE01		0	
2515	BROMOFORM	6.1	T1	III	6.1	802	LQ7		PP, EP, TOX, A	VE02		0	
2516	CARBON TETRABROMIDE	6.1	T2	III	6.1	802	LQ9		PP, EP			0	
2517	1-CHLORO-1,1-DIFLUOROETHANE (REFRIGERANT GAS R 142b)	2	2F		2,1		LQ0		PP, EX, A	VE01		1	
2518	1,5,9-CYCLODODECADIENE	6.1	T1	III	6.1	802	LQ7	T	PP, EP, TOX, A	VE02		0	
2520	CYCLOOCTADIENES	3	F1	III	3		LQ7		PP, EX, A	VE01		0	
2521	DIKETENE, STABILIZED	6.1	TF1	I	6.1+3	802	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
2522	2-DIMETHYLAMINOETHYL METHACRYLATE	6.1	T1	II	6.1	802	LQ17		PP, EP, TOX, A	VE02		2	
2524	ETHYL ORTHOFORMATE	3	F1	III	3		LQ7		PP, EX, A	VE01		0	
2525	ETHYL OXALATE	6.1	T1	III	6.1	802	LQ7		PP, EP, TOX, A	VE02		0	
2526	FURFURYLAMINE	3	FC	III	3+8		LQ7		PP, EP, EX, A	VE01		0	
2527	ISOBUTYL ACRYLATE, STABILIZED	3	F1	III	3		LQ7		PP, EX, A	VE01		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2528	ISOBUTYL ISOBUTYRATE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2529	ISOBUTYRIC ACID	3	FC	III	3+8		LQ7	E1	PP, EP, EX, A	VE01		0	
2531	METHACRYLIC ACID, STABILIZED	8	C3	II	8		LQ22	E2	PP, EP			0	
2533	METHYL TRICHLOROACETATE	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2534	METHYLCHLOROSILANE	2	2TFC		2.3+2.1+8		LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
2535	4-METHYLMORPHOLINE (N-METHYLMORPHOLINE)	3	FC	II	3+8		LQ4	E2	PP, EP, EX, A	VE01		1	
2536	METHYL-TETRAHYDROFURAN	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
2538	NITRONAPHTHALENE	4,1	F1	III	4,1		LQ9	E1	PP			0	
2541	TERPINOLENE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2542	TRIBUTYLAMINE	6,1	T1	II	6,1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2545	HAFNIUM POWDER, DRY	4,2	S4	I	4,2	540	LQ0	E0	PP			0	
2545	HAFNIUM POWDER, DRY	4,2	S4	II	4,2	540	LQ0	E2	PP			0	
2545	HAFNIUM POWDER, DRY	4,2	S4	III	4,2	540	LQ0	E1	PP			0	
2546	TITANIUM POWDER, DRY	4,2	S4	I	4,2	540	LQ0	E0	PP			0	
2546	TITANIUM POWDER, DRY	4,2	S4	II	4,2	540	LQ0	E2	PP			0	
2546	TITANIUM POWDER, DRY	4,2	S4	III	4,2	540	LQ0	E1	PP			0	
2547	SODIUM SUPEROXIDE	5,1	O2	III	5,1		LQ0	E0	PP			0	
2548	CHLORINE PENTAFLUORIDE	2	2TOC		2.3+5.1+8		LQ0	E0	PP, EP, TOX, A	VE02		2	
2552	HEXAFLUOROACETONE HYDRATE, LIQUID	6,1	T1	II	6,1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2554	METHYLALYL CHLORIDE	3	F1	II	3		LQ4	E2	A			1	
2555	NITROCELLULOSE WITH WATER (not less than 25% water, by mass)	4,1	D	II	4,1	541	LQ0	E0	PP			0	
2556	NITROCELLULOSE WITH ALCOHOL (not less than 25% alcohol, by mass; and not more than 12.6% nitrogen, by dry mass)	4,1	D	II	4,1	541	LQ0	E0	PP			0	
2557	NITROCELLULOSE, with not more than 12.6% nitrogen, by dry mass, MIXTURE WITH or WITHOUT PLASTICIZER, WITH or WITHOUT PIGMENT	4,1	D	II	4,1	241 541	LQ0	E0	PP			0	
2558	EPIBROMOHYDRIN	6,1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2560	2-METHYLPENTAN-2-OL	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2561	3-METHYL-1-BUTENE	3	F1	I	3		LQ3	E3	PP, EX, A	VE01		1	
2564	TRICHLOROACETIC ACID SOLUTION	8	C3	II	8		LQ22	E2	PP, EP			0	
2564	TRICHLOROACETIC ACID SOLUTION	8	C3	III	8		LQ7	E1	PP, EP			0	
2565	DICYCLOHEXYLAMINE	8	C7	III	8		LQ7	E1	PP, EP			0	
2567	SODIUM PENTACHLOROPHENATE	6,1	T2	II	6,1	802	LQ18	E4	PP, EP			2	
2570	CADMIUM COMPOUND	6,1	T5	I	6,1	274 596 802	LQ0	E5	PP, EP			2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2570	CADMIUM COMPOUND	6,1	T5	II	6,1	274 596 802	LQ18 E4		PP, EP			2	
2570	CADMIUM COMPOUND	6,1	T5	III	6,1	274 596 802	LQ9 E1		PP, EP			0	
2571	ALKYLSULPHURIC ACIDS	8	C3	II	8	802	LQ22 E2		PP, EP			0	
2572	PHENYLHYDRAZINE	6,1	T1	II	6,1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
2573	THALLIUM CHLORATE	5,1	OT2	II	5.1+6.1	802	LQ11 E2		PP			2	
2574	TRICRESYL PHOSPHATE with more than 3% ortho isomer	6,1	T1	II	6,1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
2576	PHOSPHORUS OXYBROMIDE, MOLTEN	8	C1	II	8		LQ0 E0		PP, EP			0	
2577	PHENYLACETYL CHLORIDE	8	C3	II	8		LQ22 E2		PP, EP			0	
2578	PHOSPHORUS TRIOXIDE	8	C2	III	8		LQ24 E1		PP, EP			0	
2579	PIPERAZINE	8	C8	III	8		LQ24 E1		PP, EP			0	
2580	ALUMINIUM BROMIDE SOLUTION	8	C1	III	8		LQ7 E1		PP, EP			0	
2581	ALUMINIUM CHLORIDE SOLUTION	8	C1	III	8		LQ7 E1		PP, EP			0	
2582	FERRIC CHLORIDE SOLUTION	8	C1	III	8		LQ7 E1		PP, EP			0	
2583	ALKYLSULPHONIC ACIDS, SOLID or ARYLSULPHONIC ACIDS, SOLID with more than 5% free sulphuric acid	8	C2	II	8	274	LQ23 E2		PP, EP			0	
2584	ALKYLSULPHONIC ACIDS, LIQUID or ARYLSULPHONIC ACIDS, LIQUID with more than 5% free sulphuric acid	8	C1	II	8	274	LQ22 E2		PP, EP			0	
2585	ALKYLSULPHONIC ACIDS, SOLID or ARYLSULPHONIC ACIDS, SOLID with not more than 5% free sulphuric acid	8	C4	III	8	274	LQ24 E1		PP, EP			0	
2586	ALKYLSULPHONIC ACIDS, LIQUID or ARYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	8	C3	III	8	274	LQ7 E1		PP, EP			0	
2587	BENZOQUINONE	6,1	T2	II	6,1	802	LQ18 E4		PP, EP			2	
2588	PESTICIDE, SOLID, TOXIC, N.O.S.	6,1	T7	I	6,1	61 274 648 802	LQ0 E5		PP, EP			2	
2588	PESTICIDE, SOLID, TOXIC, N.O.S.	6,1	T7	II	6,1	61 274 648 802	LQ18 E4		PP, EP			2	
2588	PESTICIDE, SOLID, TOXIC, N.O.S.	6,1	T7	III	6,1	61 274 648 802	LQ9 E1		PP, EP			0	
2589	VINYL CHLOROACETATE	6,1	TF1	II	6.1+3	802	LQ17 E4		PP, EP, EX, TOX, A	VE01, VE02		2	

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(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a) (7b)	(8)	(9)	(10)	(11)	(12)	(13)
2590	WHITE ASBESTOS (chrysotile, actinolite, anthophyllite, tremolite)	9	M1	III	9	168 542 802	LQ27 E1		PP			0	
2591	XENON REFRIGERATED LIQUID	2	3A		2,2	593	LQ1 E1		PP			0	
2599	CHLOROTRIFLUORO-METHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE with approximately 60% chlorotrifluoromethane (REFRIGERANT GAS R 503)	2	2A		2,2		LQ1 E1		PP			0	
2601	CYCLOBUTANE	2	2F		2,1		LQ0 E0		PP, EX, A	VE01		1	
2602	DICHLORODIFLUOROMETHANE AND 1,1-DIFLUOROETHANE AZEOTROPIC MIXTURE with approximately 74% dichlorodifluoromethane (REFRIGERANT GAS R 500)	2	2A		2,2		LQ1 E1		PP			0	
2603	CYCLOHEPTADIENE	3	FT1	II	3+6.1	802	LQ0 E2		PP, EP, EX, TOX, A	VE01, VE02		2	
2604	BORON TRIFLUORIDE DIETHYL ETHERATE	8	CF1	I	8+3		LQ0 E0		PP, EP, EX, A	VE01		1	
2605	METHOXYMETHYL ISOCYANATE	3	FT1	I	3+6.1	802	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2606	METHYL ORTHOSILICATE	6,1	TF1	I	6.1+3	802	LQ0 E5		PP, EP, EX, TOX, A	VE01, VE02		2	
2607	ACROLEIN DIMER, STABILIZED	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2608	NITROPROPANES	3	F1	III	3		LQ7 E1	T	PP, EX, A	VE01		0	
2609	TRIALLYL BORATE	6,1	T1	III	6,1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
2610	TRIALLYLAMINE	3	FC	III	3+8		LQ7 E1		A	VE01		0	
2611	PROPYLENE CHLOROXYDRIN	6,1	TF1	II	6.1+3	802	LQ17 E4		PP, EP, EX, TOX, A	VE01, VE02		2	
2612	METHYL PROPYL ETHER	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
2614	METHALLYL ALCOHOL	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2615	ETHYL PROPYL ETHER	3	F1	II	3		LQ4 E2	T	PP, EX, A	VE01		1	
2616	TRISOPROPYL BORATE	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
2616	TRISOPROPYL BORATE	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2617	METHYL-CYCLOHEXANOLS, flammable	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2618	VINYLTOLUENES, STABILIZED	3	F1	III	3		LQ7 E1	T	PP, EX, A	VE01		0	
2619	BENZYLDIMETHYLAMINE	8	CF1	II	8+3		LQ22 E2		PP, EP, EX, A	VE01		1	
2620	AMYL BUTYRATES	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2621	ACETYL METHYL CARBINOL	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2622	GLYCIDALDEHYDE	3	FT1	II	3+6.1	802	LQ0 E2		PP, EP, EX, TOX, A	VE01, VE02		2	
2623	FIRELIGHTERS, SOLID with flammable liquid	4,1	F1	III	4,1		LQ9 E1		PP		HA08	0	
2624	MAGNESIUM SILICIDE	4,3	W2	II	4,3		LQ11 E2		PP, EX, A	VE01		0	
2626	CHLORIC ACID, AQUEOUS SOLUTION with not more than 10% chloric acid	5,1	O1	II	5,1	613	LQ10 E2		PP			0	

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(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
2627	NITRITES, INORGANIC, N.O.S.	5.1	O2	II	5.1	103 274	LQ11 E2		PP			0	
2628	POTASSIUM FLUOROACETATE	6.1	T2	I	6.1	802	LQ0		PP, EP			2	
2629	SODIUM FLUOROACETATE	6.1	T2	I	6.1	802	LQ0		PP, EP			2	
2630	SELENATES or SELENITES	6.1	T5	I	6.1	274 802	LQ0 E5		PP, EP			2	
2642	FLUOROACETIC ACID	6.1	T2	I	6.1	802	LQ0		PP, EP			2	
2643	METHYL BROMOACETATE	6.1	T1	II	6.1	802	LQ17		PP, EP, TOX, A	VE02		2	
2644	METHYL IODIDE	6.1	T1	I	6.1	802	LQ0		PP, EP, TOX, A	VE02		2	
2645	PHENACYL BROMIDE	6.1	T2	II	6.1	802	LQ18		PP, EP			2	
2646	HEXACHLOROCYCLOPENTADIENE	6.1	T1	I	6.1	802	LQ0		PP, EP, TOX, A	VE02		2	
2647	MALONONITRILE	6.1	T2	II	6.1	802	LQ18		PP, EP			2	
2648	1,2-DIBROMOBUTAN-3-ONE	6.1	T1	II	6.1	802	LQ17		PP, EP, TOX, A	VE02		2	
2649	1,3-DICHLOROACETONE	6.1	T2	II	6.1	802	LQ18		PP, EP			2	
2650	1,1-DICHLORO-1-NITROETHANE	6.1	T1	II	6.1	802	LQ17		PP, EP, TOX, A	VE02		2	
2651	4,4'-DIAMINODIPHENYLMETHANE	6.1	T2	III	6.1	802	LQ9	T	PP, EP			0	
2653	BENZYL IODIDE	6.1	T1	II	6.1	802	LQ17		PP, EP, TOX, A	VE02		2	
2655	POTASSIUM FLUOROSILICATE	6.1	T5	III	6.1	802	LQ9		PP, EP			0	
2656	QUINOLINE	6.1	T1	III	6.1	802	LQ7		PP, EP, TOX, A	VE02		0	
2657	SELENIUM DISULPHIDE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
2659	SODIUM CHLOROACETATE	6.1	T2	III	6.1	802	LQ9		PP, EP			0	
2660	NITROTOLUIDINES (MONO)	6.1	T2	III	6.1	802	LQ9		PP, EP			0	
2661	HEXACHLOROACETONE	6.1	T1	III	6.1	802	LQ7		PP, EP, TOX, A	VE02		0	
2664	DIBROMOMETHANE	6.1	T1	III	6.1	802	LQ7		PP, EP, TOX, A	VE02		0	
2667	BUTYL TOLUENES	6.1	T1	III	6.1	802	LQ7		PP, EP, TOX, A	VE02		0	
2668	CHLOROACETONITRILE	6.1	TF1	II	6.1+3	802	LQ17		PP, EP, EX, TOX, A	VE01, VE02		2	
2669	CHLOROCRESOLS, SOLUTION	6.1	T1	II	6.1	802	LQ17		PP, EP, TOX, A	VE02		2	
2669	CHLOROCRESOLS, SOLUTION	6.1	T1	III	6.1	802	LQ7		PP, EP, TOX, A	VE02		0	
2670	CYANURIC CHLORIDE	8	C4	II	8		LQ23		PP, EP			0	
2671	AMINOPYRIDINES (o-, m-, p-)	6.1	T2	II	6.1	802	LQ18		PP, EP			2	

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(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a) (7b)	(8)	(9)	(10)	(11)	(12)	(13)
2672	AMMONIA SOLUTION, relative density between 0.880 and 0.957 at 15 °C in water, with more than 10% but not more than 35% ammonia	8	C5	III	8	543	LQ7 E1	T	PP, EP			0	
2673	2-AMINO-4-CHLOROPHENOL	6,1	T2	II	6,1	802	LQ18 E4		PP, EP			2	
2674	SODIUM FLUOROSILICATE	6,1	T5	III	6,1	802	LQ9 E1		PP, EP			0	
2676	STIBINE	2	2TF		2,3+2,1		LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2677	RUBIDIUM HYDROXIDE SOLUTION	8	C5	II	8		LQ22 E2		PP, EP			0	
2677	RUBIDIUM HYDROXIDE SOLUTION	8	C5	III	8		LQ7 E1		PP, EP			0	
2678	RUBIDIUM HYDROXIDE	8	C6	II	8		LQ23 E2		PP, EP			0	
2679	LITHIUM HYDROXIDE SOLUTION	8	C5	II	8		LQ22 E2		PP, EP			0	
2679	LITHIUM HYDROXIDE SOLUTION	8	C5	III	8		LQ7 E1		PP, EP			0	
2680	LITHIUM HYDROXIDE	8	C6	II	8		LQ23 E2		PP, EP			0	
2681	CAESIUM HYDROXIDE SOLUTION	8	C5	II	8		LQ22 E2		PP, EP			0	
2681	CAESIUM HYDROXIDE SOLUTION	8	C5	III	8		LQ7 E1		PP, EP			0	
2682	CAESIUM HYDROXIDE	8	C6	II	8		LQ23 E2		PP, EP			0	
2683	AMMONIUM SULPHIDE SOLUTION	8	CFT	II	8+3+6,1	802	LQ22 E2	T	PP, EP, EX, TOX, A	VE01, VE02		2	
2684	3-DIETHYLAMINOPROPYLAMINE	3	FC	III	3+8		LQ7 E1		PP, EP, EX, A	VE01		0	
2685	N,N-DIETHYLETHYLENEDIAMINE	8	CF1	II	8+3		LQ22 E2		PP, EP, EX, A	VE01		1	
2686	2-DIETHYLAMINOETHANOL	8	CF1	II	8+3		LQ22 E2		PP, EP, EX, A	VE01		1	
2687	DICYCLOHEXYLAMMONIUM NITRITE	4,1	F3	III	4,1		LQ9 E1		PP			0	
2688	1-BROMO-3-CHLOROPROPANE	6,1	T1	III	6,1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
2689	GLYCEROL alpha-MONOCHLOROXYDRIN	6,1	T1	III	6,1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
2690	N,n-BUTYLIMIDAZOLE	6,1	T1	II	6,1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
2691	PHOSPHORUS PENTABROMIDE	8	C2	II	8		LQ23 E2		PP, EP			0	
2692	BORON TRIBROMIDE	8	C1	I	8		LQ0 E0		PP, EP			0	
2693	BISULPHITES, AQUEOUS SOLUTION, N.O.S.	8	C1	III	8	274	LQ7 E1	T	PP, EP			0	
2698	TETRAHYDROPHTHALIC ANHYDRIDES with more than 0.05% of maleic anhydride	8	C4	III	8	169	LQ24 E1		PP, EP			0	
2699	TRIFLUOROACETIC ACID	8	C3	I	8		LQ0 E0		PP, EP			0	
2705	1-PENTOL	8	C9	II	8		LQ22 E2		PP, EP			0	
2707	DIMETHYLDIOXANES	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
2707	DIMETHYLDIOXANES	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2709	BUTYLBENZENES	3	F1	III	3		LQ7 E1	T	PP, EX, A	VE01		0	
2710	DIPROPYL KETONE	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2713	ACRIDINE	6,1	T2	III	6,1	802	LQ9 E1		PP, EP			0	
2714	ZINC RESINATE	4,1	F3	III	4,1		LQ9 E1		PP			0	
2715	ALUMINIUM RESINATE	4,1	F3	III	4,1		LQ9 E1		PP			0	
2716	1,4-BUTYNEDIOL	6,1	T2	III	6,1	802	LQ9 E1		PP, EP			0	
2717	CAMPHOR, synthetic	4,1	F1	III	4,1		LQ9 E1		PP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) LQ11 LQ12	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2719	BARIUM BROMATE	5.1	OT2	II	5.1+6.1	802	E2		PP			2	
2720	CHROMIUM NITRATE	5.1	O2	III	5.1		E1	B	PP		CO02, LO04	0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
2721	COPPER CHLORATE	5.1	O2	II	5.1		E2		PP			0	
2722	LITHIUM NITRATE	5.1	O2	III	5.1		E1	B	PP		CO02, LO04	0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
2723	MAGNESIUM CHLORATE	5.1	O2	II	5.1		E2		PP			0	
2724	MANGANESE NITRATE	5.1	O2	III	5.1		E1	B	PP		CO02, LO04	0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
2725	NICKEL NITRATE	5.1	O2	III	5.1		E1	B	PP		CO02, LO04	0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
2726	NICKEL NITRITE	5.1	O2	III	5.1		E1		PP			0	
2727	THALLIUM NITRATE	6.1	TO2	II	6.1+5.1	802	E4		PP, EP			2	
2728	ZIRCONIUM NITRATE	5.1	O2	III	5.1		E1	B	PP		CO02, LO04	0	CO02 and LO04 apply only when this substance is carried in bulk or without packaging
2729	HEXACHLOROBENZENE	6.1	T2	III	6.1	802	E1		PP, EP			0	
2730	NITROANISOLE, LIQUID	6.1	T1	III	6.1	279 802	E1		PP, EP, TOX, A	VE02		0	
2732	NITROBENZENES, LIQUID	6.1	T1	III	6.1	802	E1		PP, EP, TOX, A	VE02		0	
2733	AMINES, FLAMMABLE, CORROSIVE, N.O.S. or POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S.	3	FC	I	3+8	274 544	E0		PP, EP, EX, A	VE01		1	
2733	AMINES, FLAMMABLE, CORROSIVE, N.O.S. or POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S.	3	FC	II	3+8	274 544	E2	T	PP, EP, EX, A	VE01		1	
2733	AMINES, FLAMMABLE, CORROSIVE, N.O.S. or POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S.	3	FC	III	3+8	274 544	E1		PP, EP, EX, A	VE01		0	

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(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
2734	AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.	8	CF1	I	8+3	274	LQ0	E0	PP, EP, EX, A	VE01		1	
2734	AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.	8	CF1	II	8+3	274	LQ22	E2	PP, EP, EX, A	VE01		1	
2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8	C7	I	8	274	LQ0	E0	PP, EP			0	
2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8	C7	II	8	274	LQ22	E2	PP, EP			0	
2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8	C7	III	8	274	LQ7	E1	PP, EP			0	
2738	N-BUTYLANILINE	6,1	T1	II	6,1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2739	BUTYRIC ANHYDRIDE	8	C3	III	8		LQ7	E1	PP, EP			0	
2740	n-PROPYL CHLOROFORMATE	6,1	TFC	I	6.1+3+8	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2741	BARIUM HYPOCHLORITE with more than 22% available chlorine	5,1	OT2	II	5.1+6.1	802	LQ11	E2	PP			2	
2742	CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.	6,1	TFC	II	6.1+3+8	274 561 802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
2743	n-BUTYL CHLOROFORMATE	6,1	TFC	II	6.1+3+8	802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
2744	CYCLOBUTYL CHLOROFORMATE	6,1	TFC	II	6.1+3+8	802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
2745	CHLOROMETHYL CHLOROFORMATE	6,1	TC1	II	6.1+8	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2746	PHENYL CHLOROFORMATE	6,1	TC1	II	6.1+8	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2747	tet-BUTYLCYCLOHEXYL CHLOROFORMATE	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2748	2-ETHYLHEXYL CHLOROFORMATE	6,1	TC1	II	6.1+8	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2749	TETRAMETHYLSILANE	3	F1	I	3		LQ3	E3	PP, EX, A	VE01		1	
2750	1,3-DICHLOROPROPANOL-2	6,1	T1	II	6,1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2751	DIETHYLTHIOPHOSPHORYL CHLORIDE	8	C3	II	8		LQ22	E2	PP, EP			0	
2752	1,2-EPOXY-3-ETHOXYPROPANE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2753	N-ETHYLBENZYL TOLUIDINES, LIQUID	6,1	T1	III	6,1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2754	N-ETHYL TOLUIDINES	6,1	T1	II	6,1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	

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	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2757	CARBAMATE PESTICIDE, SOLID, TOXIC	6,1	T7	I	6,1	61 274 648 802	LQ0 E5		PP, EP			2	
2757	CARBAMATE PESTICIDE, SOLID, TOXIC	6,1	T7	II	6,1	61 274 648 802	LQ18 E4		PP, EP			2	
2757	CARBAMATE PESTICIDE, SOLID, TOXIC	6,1	T7	III	6,1	61 274 648 802	LQ9 E1		PP, EP			0	
2758	CARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 648 802	LQ3 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2758	CARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 648 802	LQ4 E2		PP, EP, EX, TOX, A	VE01, VE02		2	
2759	ARSENICAL PESTICIDE, SOLID, TOXIC	6,1	T7	I	6,1	61 274 648 802	LQ0 E5		PP, EP			2	
2759	ARSENICAL PESTICIDE, SOLID, TOXIC	6,1	T7	II	6,1	61 274 648 802	LQ18 E4		PP, EP			2	
2759	ARSENICAL PESTICIDE, SOLID, TOXIC	6,1	T7	III	6,1	61 274 648 802	LQ9 E1		PP, EP			0	
2760	ARSENICAL PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 648 802	LQ3 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2760	ARSENICAL PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 648 802	LQ4 E2		PP, EP, EX, TOX, A	VE01, VE02		2	
2761	ORGANOCHLORINE PESTICIDE, SOLID, TOXIC	6,1	T7	I	6,1	61 274 648 802	LQ0 E5		PP, EP			2	
2761	ORGANOCHLORINE PESTICIDE, SOLID, TOXIC	6,1	T7	II	6,1	61 274 648 802	LQ18 E4		PP, EP			2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2761	ORGANOCHLORINE PESTICIDE, SOLID, TOXIC	6,1	17	III	6,1	61 274 648 802	LQ9 E1		PP, EP			0	
2762	ORGANOCHLORINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 802	LQ3 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2762	ORGANOCHLORINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 802	LQ4 E2		PP, EP, EX, TOX, A	VE01, VE02		2	
2763	TRIAZINE PESTICIDE, SOLID, TOXIC	6,1	17	I	6,1	61 274 648 802	LQ0 E5		PP, EP			2	
2763	TRIAZINE PESTICIDE, SOLID, TOXIC	6,1	17	II	6,1	61 274 648 802	LQ18 E4		PP, EP			2	
2763	TRIAZINE PESTICIDE, SOLID, TOXIC	6,1	17	III	6,1	61 274 648 802	LQ9 E1		PP, EP			0	
2764	TRIAZINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 802	LQ3 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2764	TRIAZINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 802	LQ4 E2		PP, EP, EX, TOX, A	VE01, VE02		2	
2771	THIOCARBAMATE PESTICIDE, SOLID, TOXIC	6,1	17	I	6,1	61 274 648 802	LQ0 E5		PP, EP			2	
2771	THIOCARBAMATE PESTICIDE, SOLID, TOXIC	6,1	17	II	6,1	61 274 648 802	LQ18 E4		PP, EP			2	
2771	THIOCARBAMATE PESTICIDE, SOLID, TOXIC	6,1	17	III	6,1	61 274 648 802	LQ9 E1		PP, EP			0	
2772	THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 802	LQ3 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2772	THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 802	LQ4 E2		PP, EP, EX, TOX, A	VE01, VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2775	COPPER BASED PESTICIDE, SOLID, TOXIC	6,1	T7	I	6,1	61 274 648 802	LQ0 E5		PP, EP			2	
2775	COPPER BASED PESTICIDE, SOLID, TOXIC	6,1	T7	II	6,1	61 274 648 802	LQ18 E4		PP, EP			2	
2775	COPPER BASED PESTICIDE, SOLID, TOXIC	6,1	T7	III	6,1	61 274 648 802	LQ9 E1		PP, EP			0	
2776	COPPER BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 802	LQ3 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2776	COPPER BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 802	LQ4 E2		PP, EP, EX, TOX, A	VE01, VE02		2	
2777	MERCURY BASED PESTICIDE, SOLID, TOXIC	6,1	T7	I	6,1	61 274 648 802	LQ0 E5		PP, EP			2	
2777	MERCURY BASED PESTICIDE, SOLID, TOXIC	6,1	T7	II	6,1	61 274 648 802	LQ18 E4		PP, EP			2	
2777	MERCURY BASED PESTICIDE, SOLID, TOXIC	6,1	T7	III	6,1	61 274 648 802	LQ9 E1		PP, EP			0	
2778	MERCURY BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 802	LQ3 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2778	MERCURY BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 802	LQ4 E2		PP, EP, EX, TOX, A	VE01, VE02		2	
2779	SUBSTITUTED NITROPHENOL PESTICIDE, SOLID, TOXIC	6,1	T7	I	6,1	61 274 648 802	LQ0 E5		PP, EP			2	
2779	SUBSTITUTED NITROPHENOL PESTICIDE, SOLID, TOXIC	6,1	T7	II	6,1	61 274 648 802	LQ18 E4		PP, EP			2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2779	SUBSTITUTED NITROPHENOL PESTICIDE, SOLID, TOXIC	6.1	17	III	6.1	61 274 648 802	LQ9 E1		PP, EP			0	
2780	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 802	LQ3 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2780	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 802	LQ4 E2		PP, EP, EX, TOX, A	VE01, VE02		2	
2781	BIPYRIDILIUM PESTICIDE, SOLID, TOXIC	6.1	17	I	6.1	61 274 648 802	LQ0 E5		PP, EP			2	
2781	BIPYRIDILIUM PESTICIDE, SOLID, TOXIC	6.1	17	II	6.1	61 274 648 802	LQ18 E4		PP, EP			2	
2781	BIPYRIDILIUM PESTICIDE, SOLID, TOXIC	6.1	17	III	6.1	61 274 648 802	LQ9 E1		PP, EP			0	
2782	BIPYRIDILIUM PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 802	LQ3 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2782	BIPYRIDILIUM PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 802	LQ4 E2		PP, EP, EX, TOX, A	VE01, VE02		2	
2783	ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC	6.1	17	I	6.1	61 274 648 802	LQ0 E5		PP, EP			2	
2783	ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC	6.1	17	II	6.1	61 274 648 802	LQ18 E4		PP, EP			2	
2783	ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC	6.1	17	III	6.1	61 274 648 802	LQ9 E1		PP, EP			0	
2784	ORGANOPHOSPHORUS PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 802	LQ3 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2784	ORGANOPHOSPHORUS PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 802	LQ4 E2		PP, EP, EX, TOX, A	VE01, VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2785	4-THIAPENTANAL	6.1	T1	III	6.1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
2786	ORGANOTIN PESTICIDE, SOLID, TOXIC	6.1	T7	I	6.1	61 274 648 802	LQ0 E5		PP, EP			2	
2786	ORGANOTIN PESTICIDE, SOLID, TOXIC	6.1	T7	II	6.1	61 274 648 802	LQ18 E4		PP, EP			2	
2786	ORGANOTIN PESTICIDE, SOLID, TOXIC	6.1	T7	III	6.1	61 274 648 802	LQ9 E1		PP, EP			0	
2787	ORGANOTIN PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 802	LQ3 E0		PP, EP, EX, TOX, A	VE01, VE02		2	
2787	ORGANOTIN PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 802	LQ4 E2		PP, EP, EX, TOX, A	VE01, VE02		2	
2788	ORGANOTIN COMPOUND, LIQUID, N.O.S.	6.1	T3	I	6.1	43 274 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
2788	ORGANOTIN COMPOUND, LIQUID, N.O.S.	6.1	T3	II	6.1	43 274 802	LQ17 E4		PP, EP, TOX, A	VE02		2	
2788	ORGANOTIN COMPOUND, LIQUID, N.O.S.	6.1	T3	III	6.1	43 274 802	LQ7 E1		PP, EP, TOX, A	VE02		0	
2789	ACETIC ACID, GLACIAL or ACETIC ACID SOLUTION, more than 80% acid, by mass	8	CF1	II	8+3		LQ22 E2	T	PP, EP, EX, A	VE01		1	
2790	ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass	8	C3	II	8		LQ22 E2	T	PP, EP			0	
2790	ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass	8	C3	III	8	597 647	LQ7 E1	T	PP, EP			0	
2793	FERROUS METAL BORINGS, SHAVINGS, TURNINGS or CUTTINGS in a form liable to self-heating	4.2	S4	III	4.2	592	LQ0 E1	B	PP		LO02	0	LO02 applies only when this substance is carried in bulk or without packaging
2794	BATTERIES, WET, FILLED WITH ACID, electric storage	8	C11		8	295 598	LQ0 E0		PP, EP			0	
2795	BATTERIES, WET, FILLED WITH ALKALI, electric storage	8	C11		8	295 598	LQ0 E0		PP, EP			0	
2796	SULPHURIC ACID with not more than 51% acid or BATTERY FLUID, ACID	8	C1	II	8		LQ22 E2	T	PP, EP			0	
2797	BATTERY FLUID, ALKAL	8	C5	II	8		LQ22 E2	T	PP, EP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2798	PHENYLPHOSPHORUS DICHLORIDE	8	C3	II	8		LQ22	E2	PP, EP			0	
2799	PHENYLPHOSPHORUS THIODICHLORIDE	8	C3	II	8		LQ22	E2	PP, EP			0	
2800	BATTERIES, WET, NON-SPILLABLE, electric storage	8	C11		8	238 295 598	LQ0	E0	PP, EP			0	
2801	DYE, LIQUID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, LIQUID, CORROSIVE, N.O.S.	8	C9	I	8	274	LQ0	E0	PP, EP			0	
2801	DYE, LIQUID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, LIQUID, CORROSIVE, N.O.S.	8	C9	II	8	274	LQ22	E2	PP, EP			0	
2801	DYE, LIQUID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, LIQUID, CORROSIVE, N.O.S.	8	C9	III	8	274	LQ7	E1	PP, EP			0	
2802	COPPER CHLORIDE	8	C2	III	8		LQ24	E1	PP, EP			0	
2803	GALLIUM	8	C10	III	8		LQ24	E0	PP, EP			0	
2805	LITHIUM HYDRIDE, FUSED SOLID	4.3	W2	II	4.3		LQ11	E2	PP, EX. A	VE01	HA08	0	
2806	LITHIUM NITRIDE	4.3	W2	I	4.3		LQ0	E0	PP, EX. A	VE01	HA08	0	
2807	Magnetized material	9	M11										
2809	MERCURY	8	C9	III	8	599	LQ19	E0	PP, EP			0	
2810	TOXIC LIQUID, ORGANIC, N.O.S.	6.1	T1	I	6.1	274 315 614	LQ0	E5	PP, EP, TOX, A	VE02		2	
2810	TOXIC LIQUID, ORGANIC, N.O.S.	6.1	T1	II	6.1	274 614 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2810	TOXIC LIQUID, ORGANIC, N.O.S.	6.1	T1	III	6.1	274 614 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2811	TOXIC SOLID, ORGANIC, N.O.S.	6.1	T2	I	6.1	274 614 802	LQ0	E5	PP, EP			2	
2811	TOXIC SOLID, ORGANIC, N.O.S.	6.1	T2	II	6.1	274 614 802	LQ18	E4	PP, EP			2	
2811	TOXIC SOLID, ORGANIC, N.O.S.	6.1	T2	III	6.1	274 614 802	LQ9	E1	PP, EP			0	
2812	Sodium aluminate, solid	8	C6										
2813	WATER-REACTIVE SOLID, N.O.S.	4.3	W2	I	4.3	274	LQ0	E0	PP, EX. A	VE01	HA08	0	
2813	WATER-REACTIVE SOLID, N.O.S.	4.3	W2	II	4.3	274	LQ11	E2	PP, EX. A	VE01	HA08	0	
2813	WATER-REACTIVE SOLID, N.O.S.	4.3	W2	III	4.3	274	LQ12	E1	PP, EX. A	VE01	HA08	0	
2814	INFECTIOUS SUBSTANCE, AFFECTING HUMANS	6.2	I1		6.2	318 802	LQ0	E0	PP			0	

NOT SUBJECT TO ADN

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UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a) (7b)	(8)	(9)	(10)	(11)	(12)	(13)
2814	INFECTIOUS SUBSTANCE, AFFECTING HUMANS, in refrigerated liquid nitrogen	6.2	II		6.2 +2.2	318 802	LQ0 E0		PP			0	
2814	INFECTIOUS SUBSTANCE, AFFECTING HUMANS (animal material only)	6.2	II		6.2	318 802	LQ0 E0		PP			0	
2815	N-AMINOETHYL-PIPERAZINE	8	C7	III	8	802	LQ7 E1	T	PP, EP			0	
2817	AMMONIUM HYDROGENDIFLUORIDE SOLUTION	8	CT1	II	8+6.1	802	LQ22 E2		PP, EP			2	
2817	AMMONIUM HYDROGENDIFLUORIDE SOLUTION	8	CT1	III	8+6.1	802	LQ7 E1		PP, EP			0	
2818	AMMONIUM POLYSULPHIDE SOLUTION	8	CT1	II	8+6.1	802	LQ22 E2		PP, EP			2	
2818	AMMONIUM POLYSULPHIDE SOLUTION	8	CT1	III	8+6.1	802	LQ7 E1		PP, EP			0	
2819	AMYL ACID PHOSPHATE	8	C3	III	8		LQ7 E1		PP, EP			0	
2820	BUTYRIC ACID	8	C3	III	8		LQ7 E1	T	PP, EP			0	
2821	PHENOL SOLUTION	6.1	T1	II	6.1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
2821	PHENOL SOLUTION	6.1	T1	III	6.1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
2822	2-CHLOROPYRIDINE	6.1	T1	II	6.1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
2823	CROTONIC ACID, SOLID	8	C4	III	8		LQ24 E1		PP, EP			0	
2826	ETHYL CHLOROTHIOFORMATE	8	CF1	II	8+3		LQ22 E2		PP, EP, EX, A	VE01		1	
2829	CAPROIC ACID	8	C3	III	8		LQ7 E1	T	PP, EP			0	
2830	LITHIUM FERROSILICON	4.3	W2	II	4.3		LQ11 E2		PP, EX, A	VE01	HA08	0	
2831	1,1,1-TRICHLOROETHANE	6.1	T1	III	6.1	802	LQ7 E1	T	PP, EP, TOX, A	VE02		0	
2834	PHOSPHOROUS ACID	8	C2	III	8		LQ24 E1		PP, EP			0	
2835	SODIUM ALUMINIUM HYDRIDE	4.3	W2	II	4.3		LQ11 E2		PP, EX, A	VE01	HA08	0	
2837	BISULPHATES, AQUEOUS SOLUTION	8	C1	II	8	274	LQ22 E2		PP, EP			0	
2837	BISULPHATES, AQUEOUS SOLUTION	8	C1	III	8	274	LQ7 E1		PP, EP			0	
2838	VINYL BUTYRATE, STABILIZED	3	F1	II	3		LQ4 E2		PP, EX, A	VE01		1	
2839	ALDOL	6.1	T1	II	6.1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
2840	BUTYRALDOXIME	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2841	D-n-AMYLAMINE	3	FT1	III	3+6.1	802	LQ7 E1		PP, EP, EX, TOX, A	VE01, VE02		2	
2842	NITROETHANE	3	F1	III	3		LQ7 E1		PP, EX, A	VE01		0	
2844	CALCIUM MANGANESE SILICON	4.3	W2	III	4.3		LQ12 E1		PP, EX, A	VE01	HA08	0	
2845	PYROPHORIC LIQUID, ORGANIC, N.O.S	4.2	S1	I	4.2	274	LQ0 E0		PP			0	
2846	PYROPHORIC LIQUID, ORGANIC, N.O.S	4.2	S2	I	4.2	274	LQ0 E0		PP			0	
2849	3-CHLOROPROPANOL-1	6.1	T1	III	6.1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
2850	PROPYLENE TETRAMER	3	F1	III	3		LQ7 E1	T	PP, EX, A	VE01		0	
2851	BORON TRIFLUORIDE DIHYDRATE	8	C1	II	8		LQ22 E2		PP, EP			0	
2852	DIPICRYL SULPHIDE, WETTED with not less than 10% water, by mass	4.1	D	I	4.1	545	LQ0 E0		PP			1	
2853	MAGNESIUM FLUOROSILICATE	6.1	T5	III	6.1	802	LQ9 E1		PP, EP			0	

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	3.1.2	2.2	2.2	2.1.1.3	5.2.2	3.3	3.4.6	3.2.1	8.1.5	7.1.6	7.1.6	7.1.5	3.2.1
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
2854	AMMONIUM FLUOROSILICATE	6.1	T5	III	6.1	802	LQ9		PP, EP			0	
2855	ZINC FLUOROSILICATE	6.1	T5	III	6.1	802	LQ9		PP, EP			0	
2856	FLUOROSILICATES, N.O.S.	6.1	T5	III	6.1	274 802	LQ9		PP, EP			0	
2857	REFRIGERATING MACHINES containing non-flammable, non-toxic gases or ammonia solutions (UN 2672)	2	6A		2.2	119	LQ0		PP			0	
2858	ZIRCONIUM, DRY, coiled wire, finished metal sheets, strip (thinner than 254 microns but not thinner than 18 microns)	4.1	F3	III	4.1	546	LQ9		PP			0	
2859	AMMONIUM METAVANADATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
2861	AMMONIUM POLYVANADATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
2862	VANADIUM PENTOXIDE, non-fused form	6.1	T5	III	6.1	600 802	LQ9		PP, EP			0	
2863	SODIUM AMMONIUM VANADATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
2864	POTASSIUM METAVANADATE	6.1	T5	II	6.1	802	LQ18		PP, EP			2	
2865	HYDROXYLAMINE SULPHATE	8	C2	III	8		LQ24		PP, EP			0	
2869	TITANIUM TRICHLORIDE MIXTURE	8	C2	II	8		LQ23		PP, EP			0	
2869	TITANIUM TRICHLORIDE MIXTURE	8	C2	III	8		LQ24		PP, EP			0	
2870	ALUMINIUM BOROHYDRIDE	4.2	SW	I	4.2+4.3		LQ0		PP, EX, A	VE01		0	
2870	ALUMINIUM BOROHYDRIDE IN DEVICES	4.2	SW	I	4.2+4.3		LQ0		PP, EX, A	VE01		0	
2871	ANTIMONY POWDER	6.1	T5	III	6.1	802	LQ9		PP, EP			0	
2872	DIBROMOCHLOROPANES	6.1	T1	II	6.1	802	LQ17		PP, EP, TOX, A	VE02		2	
2872	DIBROMOCHLOROPANES	6.1	T1	III	6.1	802	LQ7		PP, EP, TOX, A	VE02		0	
2873	DIBUTYLAMINOETHANOL	6.1	T1	III	6.1	802	LQ7		PP, EP, TOX, A	VE02		0	
2874	FURFURYL ALCOHOL	6.1	T1	III	6.1	802	LQ7		PP, EP, TOX, A	VE02		0	
2875	HEXACHLOROPHENE	6.1	T2	III	6.1	802	LQ9		PP, EP			0	
2876	RESORCINOL	6.1	T2	III	6.1	802	LQ9		PP, EP			0	
2878	TITANIUM SPONGE GRANULES or TITANIUM SPONGE POWDERS	4.1	F3	III	4.1		LQ9		PP			0	
2879	SELENIUM OXYCHLORIDE	8	CT1	I	8+6.1	802	LQ0		PP, EP, TOX, A	VE02		2	
2880	CALCIUM HYPOCHLORITE, HYDRATED, or CALCIUM HYPOCHLORITE, HYDRATED MIXTURE, with not less than 5.5% but not more than 16% water	5.1	O2	II	5.1	313 314 322	LQ11		PP			0	
2880	CALCIUM HYPOCHLORITE, HYDRATED or CALCIUM HYPOCHLORITE, HYDRATED MIXTURE, with not less than 5.5% but not more than 16% water	5.1	O2	III	5.1	313 314	LQ12		PP			0	
2881	METAL CATALYST, DRY	4.2	S4	I	4.2	274	LQ0		PP			0	
2881	METAL CATALYST, DRY	4.2	S4	II	4.2	274	LQ0		PP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2881	METAL CATALYST, DRY	4.2	S4	III	4.2	274	LQ0		PP			0	
2900	INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only	6.2	I2		6.2	318	LQ0		PP			0	
2900	INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only, in refrigerated liquid nitrogen	6.2	I2		6.2 +2.2	318	LQ0		PP			0	
2900	INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only (animal material only)	6.2	I2		6.2	318	LQ0		PP			0	
2901	BROMINE CHLORIDE	2	2TOC		2.3+5.1+8	802	LQ0		PP, EP, TOX, A	VE02		2	
2902	PESTICIDE, LIQUID, TOXIC, N.O.S.	6.1	T6	I	6.1	61 274 648 802	LQ0		PP, EP, TOX, A	VE02		2	
2902	PESTICIDE, LIQUID, TOXIC, N.O.S.	6.1	T6	II	6.1	61 274 648 802	LQ17		PP, EP, TOX, A	VE02		2	
2902	PESTICIDE, LIQUID, TOXIC, N.O.S.	6.1	T6	III	6.1	61 274 648 802	LQ7		PP, EP, TOX, A	VE02		0	
2903	PESTICIDE, LIQUID, TOXIC, FLAMMABLE, N.O.S., flash-point not less than 23 °C	6.1	TF2	I	6.1+3	61 274 802	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
2903	PESTICIDE, LIQUID, TOXIC, FLAMMABLE, N.O.S., flash-point not less than 23 °C	6.1	TF2	II	6.1+3	61 274 802	LQ17		PP, EP, EX, TOX, A	VE01, VE02		2	
2903	PESTICIDE, LIQUID, TOXIC, FLAMMABLE, N.O.S., flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7		PP, EP, EX, TOX, A	VE01, VE02		0	
2904	CHLOROPHENOLATES, LIQUID or PHENOLATES, LIQUID	8	C9	III	8		LQ7	T*	PP, EP			0	* applies only to phenolates but not to chlorophenolates
2905	CHLOROPHENOLATES, SOLID or PHENOLATES, SOLID	8	C10	III	8		LQ24		PP, EP			0	
2907	ISOSORBIDE DINITRATE MIXTURE with not less than 60% lactose, mannose, starch or calcium hydrogen phosphate	4.1	D	II	4.1	127	LQ8		PP			0	
2908	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - EMPTY PACKAGING	7				290	LQ0		PP			0	
2909	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - ARTICLES MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or NATURAL THORIUM	7				290	LQ0		PP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	(6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	(13)
2910	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY OF MATERIAL	7				290	LQ0	E0	PP			0	
2911	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - INSTRUMENTS or ARTICLES	7				290	LQ0	E0	PP			0	
2912	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), non fissile or fissile-excepted	7			7X	172 317 325	LQ0	E0	PP		RA01	2	
2913	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), non fissile or fissile-excepted	7			7X	172 317 336	LQ0	E0	PP		RA02, RA03	2	
2915	RADIOACTIVE MATERIAL, TYPE A PACKAGE, non-special form, non fissile or fissile-excepted	7			7X	172 317 325	LQ0	E0	PP			2	
2916	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, non fissile or fissile-excepted	7			7X	172 317 337	LQ0	E0	PP			2	
2917	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, non fissile or fissile-excepted	7			7X	172 317 337	LQ0	E0	PP			2	
2919	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, non fissile or fissile-excepted	7			7X	172 317	LQ0	E0	PP			2	
2920	CORROSIVE LIQUID, FLAMMABLE, N.O.S	8	CF1	I	8+3	274	LQ0	E0	PP, EP, EX, A	VE01		1	
2920	CORROSIVE LIQUID, FLAMMABLE, N.O.S	8	CF1	II	8+3	274	LQ22	E2	PP, EP, EX, A	VE01		1	
2921	CORROSIVE SOLID, FLAMMABLE, N.O.S	8	CF2	I	8+4.1	274	LQ0	E0	PP, EP			1	
2921	CORROSIVE SOLID, FLAMMABLE, N.O.S	8	CF2	II	8+4.1	274	LQ23	E2	PP, EP			1	
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	CT1	I	8+6.1	274 802	LQ0	E0	PP, EP, TOX, A	VE02		2	
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	CT1	II	8+6.1	274 802	LQ22	E2	PP, EP, TOX, A	VE02		2	
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	CT1	III	8+6.1	274 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2923	CORROSIVE SOLID, TOXIC, N.O.S.	8	CT2	I	8+6.1	274	LQ0	E0	PP, EP			2	
2923	CORROSIVE SOLID, TOXIC, N.O.S.	8	CT2	II	8+6.1	274 802	LQ23	E2	PP, EP			2	
2923	CORROSIVE SOLID, TOXIC, N.O.S.	8	CT2	III	8+6.1	274 802	LQ24	E1	PP, EP			0	
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S	3	FC	I	3+8	274	LQ3	E0	PP, EP, EX, A	VE01		1	
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S	3	FC	II	3+8	274	LQ4	E2	PP, EP, EX, A	VE01		1	
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S	3	FC	III	3+8	274	LQ7	E1	PP, EP, EX, A	VE01		0	
2925	FLAMMABLE SOLID, CORROSIVE, ORGANIC, N.O.S.	4.1	FC1	II	4.1+8	274	LQ0	E2	PP			1	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2925	FLAMMABLE SOLID; CORROSIVE, ORGANIC, N.O.S.	4.1	FC1	III	4.1+8	274	LQ0	E1	PP			0	
2926	FLAMMABLE SOLID; TOXIC, ORGANIC, N.O.S.	4.1	FT1	II	4.1+6.1	274 802	LQ0	E2	PP			2	
2926	FLAMMABLE SOLID; TOXIC, ORGANIC, N.O.S.	4.1	FT1	III	4.1+6.1	274 802	LQ0	E1	PP			0	
2927	TOXIC LIQUID; CORROSIVE, ORGANIC, N.O.S.	6.1	TC1	I	6.1+8	274 315 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
2927	TOXIC LIQUID; CORROSIVE, ORGANIC, N.O.S.	6.1	TC1	II	6.1+8	274 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2928	TOXIC SOLID; CORROSIVE, ORGANIC, N.O.S.	6.1	TC2	I	6.1+8	274 802	LQ0	E5	PP, EP			2	
2928	TOXIC SOLID; CORROSIVE, ORGANIC, N.O.S.	6.1	TC2	II	6.1+8	274 802	LQ18	E4	PP, EP			2	
2929	TOXIC LIQUID; FLAMMABLE, ORGANIC, N.O.S.	6.1	TF1	I	6.1+3	274 315 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
2929	TOXIC LIQUID; FLAMMABLE, ORGANIC, N.O.S.	6.1	TF1	II	6.1+3	274 802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
2930	TOXIC SOLID; FLAMMABLE, ORGANIC, N.O.S.	6.1	TF3	I	6.1+4.1	274 802	LQ0	E5	PP, EP			2	
2930	TOXIC SOLID; FLAMMABLE, ORGANIC, N.O.S.	6.1	TF3	II	6.1+4.1	274 802	LQ18	E4	PP, EP			2	
2931	VANADYL SULPHATE	6.1	TS	II	6.1	802	LQ18	E4	PP, EP			2	
2933	METHYL 2-CHLOROPROPIONATE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2934	ISOPROPYL 2-CHLOROPROPIONATE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2935	ETHYL 2-CHLOROPROPIONATE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2936	THIOLACTIC ACID	6.1	T1	II	6.1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
2937	alpha-METHYLBENZYL ALCOHOL, LIQUID	6.1	T1	III	6.1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2940	9-PHOSPHABICYCLONANES (CYCLOOCTADIENE PHOSPHINES)	4.2	S2	II	4.2		LQ0	E2	PP			0	
2941	FLUOROANILINES	6.1	T1	III	6.1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2942	2-TRIFLUOROMETHYLANILINE	6.1	T1	III	6.1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2943	TETRAHYDROFURFURYLAMINE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2945	N-METHYLBUTYLAMINE	3	FC	II	3+8		LQ4	E2	PP, EP, EX, A	VE01		1	
2946	2-AMINO-5-DIETHYLAMINOPENTANE	6.1	T1	III	6.1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
2947	ISOPROPYL CHLOROACETATE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
2948	3-TRIFLUOROMETHYLANILINE	6.1	T1	II	6.1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2949	SODIUM HYDROSULPHIDE, HYDRATED with not less than 25% water of crystallization	8	C6	II	8	523	LQ23		PP, EP			0	
2950	MAGNESIUM GRANULES, COATED, particle size not less than 149 microns	4.3	W2	III	4.3		LQ12		PP, EX, A	VE01	HA08	0	
2956	5-tert-BUTYL-2,4,6-TRINITRO-m-XYLENE (MUSK XYLENE)	4.1	SR1	III	4.1	638	LQ0		PP			0	
2965	BORON TRIFLUORIDE DIMETHYL ETHERATE	4.3	WFC	I	4.3+3+8		LQ0		PP, EP, EX, A	VE01	HA08	1	
2966	THIOGLYCOL	6.1	T1	II	6.1	802	LQ17	T	PP, EP, TOX, A	VE02		2	
2967	SULPHAMIC ACID	8	C2	III	8		LQ24		PP, EP			0	
2968	MANEB, STABILIZED or MANEB PREPARATION, STABILIZED against self-heating	4.3	W2	III	4.3	547	LQ12		PP, EX, A	VE01	HA08	0	
2969	CASTOR BEANS or CASTOR MEAL or CASTOR POMACE or CASTOR FLAKE	9	M11	II	9	141	LQ25	B	PP			0	
2977	RADIOACTIVE MATERIAL, URANIUM	7			7X+7E+8	172	LQ0		PP			2	
2978	RADIOACTIVE MATERIAL, URANIUM	7			7X+8	172	LQ0	B	PP		RA01	2	
2978	HEXAFLUORIDE, non fissile or fissile-excepted					317							
2983	ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE, not more than 30% ethylene	3	FT1	I	3+6.1	802	LQ0	T	PP, EP, EX, TOX, A	VE01, VE02		2	
2984	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 8% but less than 20% hydrogen peroxide (stabilized as necessary)	5.1	O1	III	5.1	65	LQ13		PP			0	
2985	CHLOROSILANES, FLAMMABLE, CORROSIVE, N.O.S.	3	FC	II	3+8	274	LQ4		PP, EP, EX, A	VE01		1	
2986	CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S.	8	CF1	II	8+3	274	LQ22		PP, EP, EX, A	VE01		1	
2987	CHLOROSILANES, CORROSIVE, N.O.S.	8	C3	II	8	274	LQ22		PP, EP			0	
2988	CHLOROSILANES, WATER-REACTIVE, FLAMMABLE, CORROSIVE, N.O.S.	4.3	WFC	I	4.3+3+8	274	LQ0		PP, EP, EX, A	VE01	HA08	1	
2989	LEAD PHOSPHITE, DIBASIC	4.1	F3	II	4.1	549	LQ8		PP			1	
2989	LEAD PHOSPHITE, DIBASIC	4.1	F3	III	4.1		LQ9		PP			0	
2990	LIFE-SAVING APPLIANCES, SELF-INFLATING	9	M5		9	296	LQ0		PP			0	
2991	CARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	I	6.1+3	61	LQ0		PP, EP, EX, TOX, A	VE01, VE02		2	
2991	CARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	II	6.1+3	802	LQ17		PP, EP, EX, TOX, A	VE01, VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2991	CARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7 E1		PP, EP, EX, TOX, A	VE01, VE02		0	
2992	CARBAMATE PESTICIDE, LIQUID, TOXIC	6.1	T6	I	6.1	61 274 648 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
2992	CARBAMATE PESTICIDE, LIQUID, TOXIC	6.1	T6	II	6.1	61 274 648 802	LQ17 E4		PP, EP, TOX, A	VE02		2	
2992	CARBAMATE PESTICIDE, LIQUID, TOXIC	6.1	T6	III	6.1	61 274 648 802	LQ7 E1		PP, EP, TOX, A	VE02		0	
2993	ARSENICAL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	I	6.1+3	61 274 802	LQ0 E5		PP, EP, EX, TOX, A	VE01, VE02		2	
2993	ARSENICAL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	II	6.1+3	61 274 802	LQ17 E4		PP, EP, EX, TOX, A	VE01, VE02		2	
2993	ARSENICAL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7 E1		PP, EP, EX, TOX, A	VE01, VE02		0	
2994	ARSENICAL PESTICIDE, LIQUID, TOXIC	6.1	T6	I	6.1	61 274 648 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
2994	ARSENICAL PESTICIDE, LIQUID, TOXIC	6.1	T6	II	6.1	61 274 648 802	LQ17 E4		PP, EP, TOX, A	VE02		2	
2994	ARSENICAL PESTICIDE, LIQUID, TOXIC	6.1	T6	III	6.1	61 274 648 802	LQ7 E1		PP, EP, TOX, A	VE02		0	
2995	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	I	6.1+3	61 274 802	LQ0 E5		PP, EP, EX, TOX, A	VE01, VE02		2	
2995	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	II	6.1+3	61 274 802	LQ17 E4		PP, EP, EX, TOX, A	VE01, VE02		2	
2995	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7 E1		PP, EP, EX, TOX, A	VE01, VE02		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
2996	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC	6.1	T6	I	6.1	61 274 648 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
2996	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC	6.1	T6	II	6.1	61 274 648 802	LQ17 E4		PP, EP, TOX, A	VE02		2	
2996	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC	6.1	T6	III	6.1	61 274 648 802	LQ7 E1		PP, EP, TOX, A	VE02		0	
2997	TRIAZINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	I	6.1+3	61 274 802	LQ0 E5		PP, EP, EX, TOX, A	VE01, VE02		2	
2997	TRIAZINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	II	6.1+3	61 274 802	LQ17 E4		PP, EP, EX, TOX, A	VE01, VE02		2	
2997	TRIAZINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7 E1		PP, EP, EX, TOX, A	VE01, VE02		0	
2998	TRIAZINE PESTICIDE, LIQUID, TOXIC	6.1	T6	I	6.1	61 274 648 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
2998	TRIAZINE PESTICIDE, LIQUID, TOXIC	6.1	T6	II	6.1	61 274 648 802	LQ17 E4		PP, EP, TOX, A	VE02		2	
2998	TRIAZINE PESTICIDE, LIQUID, TOXIC	6.1	T6	III	6.1	61 274 648 802	LQ7 E1		PP, EP, TOX, A	VE02		0	
3005	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	I	6.1+3	61 274 802	LQ0 E5		PP, EP, EX, TOX, A	VE01, VE02		2	
3005	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	II	6.1+3	61 274 802	LQ17 E4		PP, EP, EX, TOX, A	VE01, VE02		2	
3005	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7 E1		PP, EP, EX, TOX, A	VE01, VE02		0	
3006	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC	6.1	T6	I	6.1	61 274 648 802	LQ0 E5		PP, EP, TOX, A	VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3006	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC	6.1	T6	II	6.1	61 274 648 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3006	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC	6.1	T6	III	6.1	61 274 648 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3009	COPPER BASED PESTICIDE, LIQUID, TOXIC FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	I	6.1+3	61 274 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
3009	COPPER BASED PESTICIDE, LIQUID, TOXIC FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	II	6.1+3	61 274 802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
3009	COPPER BASED PESTICIDE, LIQUID, TOXIC FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7	E1	PP, EP, EX, TOX, A	VE01, VE02		0	
3010	COPPER BASED PESTICIDE, LIQUID, TOXIC	6.1	T6	I	6.1	61 274 648 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3010	COPPER BASED PESTICIDE, LIQUID, TOXIC	6.1	T6	II	6.1	61 274 648 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3010	COPPER BASED PESTICIDE, LIQUID, TOXIC	6.1	T6	III	6.1	61 274 648 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3011	MERCURY BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	I	6.1+3	61 274 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
3011	MERCURY BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	II	6.1+3	61 274 802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
3011	MERCURY BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7	E1	PP, EP, EX, TOX, A	VE01, VE02		0	
3012	MERCURY BASED PESTICIDE, LIQUID, TOXIC	6.1	T6	I	6.1	61 274 648 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3012	MERCURY BASED PESTICIDE, LIQUID, TOXIC	6.1	T6	II	6.1	61 274 648 802	LQ17	E4	PP, EP, TOX, A	VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3012	MERCURY BASED PESTICIDE, LIQUID, TOXIC	6.1	T6	III	6.1	61 274 648 802	LQ7 E1		PP, EP, TOX, A	VE02		0	
3013	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	I	6.1+3	61 274 802	LQ0 E5		PP, EP, EX, TOX, A	VE01, VE02		2	
3013	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	II	6.1+3	61 274 802	LQ17 E4		PP, EP, EX, TOX, A	VE01, VE02		2	
3013	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7 E1		PP, EP, EX, TOX, A	VE01, VE02		0	
3014	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC	6.1	T6	I	6.1	61 274 648 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
3014	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC	6.1	T6	II	6.1	61 274 648 802	LQ17 E4		PP, EP, TOX, A	VE02		2	
3014	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC	6.1	T6	III	6.1	61 274 648 802	LQ7 E1		PP, EP, TOX, A	VE02		0	
3015	BIPYRIDILIJUM PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	I	6.1+3	61 274 802	LQ0 E5		PP, EP, EX, TOX, A	VE01, VE02		2	
3015	BIPYRIDILIJUM PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	II	6.1+3	61 274 802	LQ17 E4		PP, EP, EX, TOX, A	VE01, VE02		2	
3015	BIPYRIDILIJUM PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7 E1		PP, EP, EX, TOX, A	VE01, VE02		0	
3016	BIPYRIDILIJUM PESTICIDE, LIQUID, TOXIC	6.1	T6	I	6.1	61 274 648 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
3016	BIPYRIDILIJUM PESTICIDE, LIQUID, TOXIC	6.1	T6	II	6.1	61 274 648 802	LQ17 E4		PP, EP, TOX, A	VE02		2	
3016	BIPYRIDILIJUM PESTICIDE, LIQUID, TOXIC	6.1	T6	III	6.1	61 274 648 802	LQ7 E1		PP, EP, TOX, A	VE02		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3017	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	I	6.1+3	61 274 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
3017	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	II	6.1+3	61 274 802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
3017	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7	E1	PP, EP, EX, TOX, A	VE01, VE02		0	
3018	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC	6.1	T6	I	6.1	61 274 648 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3018	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC	6.1	T6	II	6.1	61 274 648 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3018	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC	6.1	T6	III	6.1	61 274 648 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3019	ORGANOTIN PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	I	6.1+3	61 274 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
3019	ORGANOTIN PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	II	6.1+3	61 274 802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
3019	ORGANOTIN PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7	E1	PP, EP, EX, TOX, A	VE01, VE02		0	
3020	ORGANOTIN PESTICIDE, LIQUID, TOXIC	6.1	T6	I	6.1	61 274 648 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3020	ORGANOTIN PESTICIDE, LIQUID, TOXIC	6.1	T6	II	6.1	61 274 648 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3020	ORGANOTIN PESTICIDE, LIQUID, TOXIC	6.1	T6	III	6.1	61 274 648 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3021	PESTICIDE, LIQUID, FLAMMABLE, TOXIC, N.O.S., flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 802	LQ3	E0	PP, EP, EX, TOX, A	VE01, VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3021	PESTICIDE, LIQUID, FLAMMABLE, TOXIC, N.O.S., flash-point less than 23 °C	3	FT2	II	3+6.1	61 274	LQ4	E2	PP, EP, EX, TOX, A	VE01, VE02		2	
3022	1,2-BUTYLENE OXIDE, STABILIZED	3	F1	II	3	802	LQ4	E2	PP, EP, EX, A	VE01		1	
3023	2-METHYL-2-HEPTANETHIOL	6.1	TF1	I	6.1+3	802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
3024	COUMARIN DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 802	LQ3	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
3024	COUMARIN DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 802	LQ4	E2	PP, EP, EX, TOX, A	VE01, VE02		2	
3025	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	I	6.1+3	61 274 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
3025	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	II	6.1+3	61 274 802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
3025	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7	E1	PP, EP, EX, TOX, A	VE01, VE02		0	
3026	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1	T6	I	6.1	61 274 648	LQ0	E5	PP, EP, TOX, A	VE02		2	
3026	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1	T6	II	6.1	61 274 648 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3026	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1	T6	III	6.1	61 274 648 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3027	COUMARIN DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1	T7	I	6.1	61 274 648	LQ0	E5	PP, EP			2	
3027	COUMARIN DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1	T7	II	6.1	61 274 648 802	LQ18	E4	PP, EP			2	
3027	COUMARIN DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1	T7	III	6.1	61 274 648 802	LQ9	E1	PP, EP			0	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3028	BATTERIES, DRY, CONTAINING POTASSIUM HYDROXIDE SOLID, electric storage	8	C11		8	295 304 598	LQ0	E0	PP, EP			0	
3048	ALUMINIUM PHOSPHIDE PESTICIDE	6.1	17	I	6.1	153 648 802	LQ0	E5	PP, EP			2	
3054	CYCLOHEXYL MERCAPTAN	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
3055	2-(2-AMINOETHOXY)ETHANOL	8	C7	III	8		LQ7	E1	PP, EP			0	
3056	n-HEPTALDEHYDE	3	F1	III	3		LQ7	E1	PP, EX, A	VE01		0	
3057	TRIFLUOROACETYL CHLORIDE	2	2TC		2.3+8		LQ0	E0	PP, EP, TOX, A	VE02		2	
3064	NITROGLYCERIN, SOLUTION IN ALCOHOL with more than 1% but not more than 5% nitroglycerin	3	D	II	3		LQ0	E0	PP, EX, A	VE01		1	
3065	ALCOHOLIC BEVERAGES, with more than 70% alcohol by volume	3	F1	II	3		LQ5	E2	PP, EX, A	VE01		1	
3065	ALCOHOLIC BEVERAGES, with more than 24% but not more than 70% alcohol by volume	3	F1	III	3	144 145 247	LQ7	E1	PP, EX, A	VE01		0	
3066	PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning and reducing compound)	8	C9	II	8	163	LQ22	E2	PP, EP			0	
3066	PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning and reducing compound)	8	C9	III	8	163	LQ7	E1	PP, EP			0	
3070	ETHYLENE OXIDE AND DICHLORODIFLUOROMETHANE MIXTURE with not more than 12.5% ethylene oxide	2	2A		2.2		LQ1	E1	PP			0	
3071	MERCAPTANS, LIQUID, TOXIC, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, TOXIC, FLAMMABLE, N.O.S.	6.1	TF1	II	6.1+3	274 802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
3072	LIFE-SAVING APPLIANCES NOT SELF-INFLATING containing dangerous goods as equipment	9	M5		9	296 635	LQ0	E0	PP			0	
3073	VINYLPYRIDINES, STABILIZED	6.1	TFC	II	6.1+3+8	802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	

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(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.	9	M7	III	9	274 335 601	LQ27 E1	T* B**	PP A***			0	* Only in the molten state. ** For carriage in bulk see also 7.1.4.1. *** Only in the case of transport in bulk.
3078	CERIUM, turnings or gritty powder	4.3	W2	II	4.3	550	LQ11 E2		PP, EX, A	VE01	HA08	0	
3079	METHACRYLONITRILE, STABILIZED	3	FT1	I	3+6.1	802	LQ0 E0	T	PP, EP, EX, TOX, A	VE01, VE02		2	
3080	ISOCYANATES, TOXIC, FLAMMABLE, N.O.S. or ISOCYANATE SOLUTION, TOXIC, FLAMMABLE, N.O.S.	6.1	TF1	II	6.1+3	274 551 802	LQ17 E4		PP, EP, EX, TOX, A	VE01, VE02		2	
3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	9	M6	III	9	274 335 601	LQ7 E1	T	PP			0	
3083	PERCHLORYL FLUORIDE	2	2T0		2.3+5.1		LQ0 E0		PP, EP, TOX, A	VE02		2	
3084	CORROSIVE SOLID, OXIDIZING, N.O.S.	8	CO2	I	8+5.1	274	LQ0 E0		PP, EP			0	
3084	CORROSIVE SOLID, OXIDIZING, N.O.S.	8	CO2	II	8+5.1	274	LQ23 E2		PP, EP			0	
3085	OXIDIZING SOLID, CORROSIVE, N.O.S.	5.1	OC2	I	5.1+8	274	LQ0 E0		PP			0	
3085	OXIDIZING SOLID, CORROSIVE, N.O.S.	5.1	OC2	II	5.1+8	274	LQ11 E2		PP			0	
3085	OXIDIZING SOLID, CORROSIVE, N.O.S.	5.1	OC2	III	5.1+8	274	LQ12 E1		PP			0	
3086	TOXIC SOLID, OXIDIZING, N.O.S.	6.1	TO2	I	6.1+5.1	274 802	LQ0 E5		PP, EP			2	
3086	TOXIC SOLID, OXIDIZING, N.O.S.	6.1	TO2	II	6.1+5.1	274 802	LQ18 E4		PP, EP			2	
3087	OXIDIZING SOLID, TOXIC, N.O.S.	5.1	OT2	I	5.1+6.1	274 802	LQ0 E0		PP			2	
3087	OXIDIZING SOLID, TOXIC, N.O.S.	5.1	OT2	II	5.1+6.1	274 802	LQ11 E2		PP			2	
3087	OXIDIZING SOLID, TOXIC, N.O.S.	5.1	OT2	III	5.1+6.1	274 802	LQ12 E1		PP			0	
3088	SELF-HEATING SOLID, ORGANIC, N.O.S.	4.2	S2	II	4.2	274	LQ0 E2		PP			0	
3088	SELF-HEATING SOLID, ORGANIC, N.O.S.	4.2	S2	III	4.2	274	LQ0 E1		PP			0	
3089	METAL POWDER, FLAMMABLE, N.O.S.	4.1	F3	II	4.1	274 552	LQ8 E2		PP			1	
3089	METAL POWDER, FLAMMABLE, N.O.S.	4.1	F3	III	4.1	274 552	LQ9 E1		PP			0	
3090	LITHIUM METAL BATTERIES (including lithium alloy batteries)	9	M4	II	9	188 230 310 636	LQ0 E0		PP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3091	LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT or LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT (including lithium alloy batteries)	9	M4	II	9	188 230 636	LQ0 E0		PP			0	
3092	1-METHOXY-2-PROPANOI	3	F1	III	3		LQ7 E1	T	PP, EX, A	VE01		0	
3093	CORROSIVE LIQUID, OXIDIZING, N.O.S	8	CO1	I	8+5.1	274	LQ0 E0		PP, EP			0	
3093	CORROSIVE LIQUID, OXIDIZING, N.O.S	8	CO1	II	8+5.1	274	LQ22 E2		PP, EP			0	
3094	CORROSIVE LIQUID, WATER-REACTIVE, N.O.S.	8	CW1	I	8+4.3	274	LQ0 E0		PP, EP			0	
3094	CORROSIVE LIQUID, WATER-REACTIVE, N.O.S.	8	CW1	II	8+4.3	274	LQ22 E2		PP, EP			0	
3095	CORROSIVE SOLID, SELF-HEATING, N.O.S	8	CS2	I	8+4.2	274	LQ0 E0		PP, EP			0	
3095	CORROSIVE SOLID, SELF-HEATING, N.O.S	8	CS2	II	8+4.2	274	LQ23 E2		PP, EP			0	
3096	CORROSIVE SOLID, WATER-REACTIVE, N.O.S.	8	CW2	I	8+4.3	274	LQ0 E0		PP, EP			0	
3096	CORROSIVE SOLID, WATER-REACTIVE, N.O.S.	8	CW2	II	8+4.3	274	LQ23 E2		PP, EP			0	
3097	FLAMMABLE SOLID, OXIDIZING, N.O.S	4.1	FO										
3098	OXIDIZING LIQUID, CORROSIVE, N.O.S	5.1	OC1	I	5.1+8	274	LQ0 E0		PP, EP			0	
3098	OXIDIZING LIQUID, CORROSIVE, N.O.S	5.1	OC1	II	5.1+8	274	LQ10 E2		PP, EP			0	
3098	OXIDIZING LIQUID, CORROSIVE, N.O.S	5.1	OC1	III	5.1+8	274	LQ13 E1		PP, EP			0	
3099	OXIDIZING LIQUID, TOXIC, N.O.S.	5.1	OT1	I	5.1+6.1	274	LQ0 E0		PP, EP, TOX, A	VE02		2	
3099	OXIDIZING LIQUID, TOXIC, N.O.S.	5.1	OT1	II	5.1+6.1	802	LQ10 E2		PP, EP, TOX, A	VE02		2	
3099	OXIDIZING LIQUID, TOXIC, N.O.S.	5.1	OT1	III	5.1+6.1	274	LQ13 E1		PP, EP, TOX, A	VE02		0	
3100	OXIDIZING SOLID, SELF-HEATING, N.O.S	5.1	OS			802							
3101	ORGANIC PEROXIDE TYPE B, LIQUID	5.2	P1		5.2+1	122 181 274	LQ14 E0		PP, EX, A	VE01	HA01, HA10	3	
3102	ORGANIC PEROXIDE TYPE B, SOLID	5.2	P1		5.2+1	122 181 274	LQ15 E0		PP, EX, A	VE01	HA01, HA10	3	
3103	ORGANIC PEROXIDE TYPE C, LIQUID	5.2	P1		5.2	122 274	LQ14 E0		PP, EX, A	VE01		0	
3104	ORGANIC PEROXIDE TYPE C, SOLID	5.2	P1		5.2	122 274	LQ15 E0		PP, EX, A	VE01		0	
3105	ORGANIC PEROXIDE TYPE D, LIQUID	5.2	P1		5.2	122 274	LQ16 E0		PP, EX, A	VE01		0	
3106	ORGANIC PEROXIDE TYPE D, SOLID	5.2	P1		5.2	122 274	LQ11 E0		PP, EX, A	VE01		0	
3107	ORGANIC PEROXIDE TYPE E, LIQUID	5.2	P1		5.2	122 274	LQ16 E0		PP, EX, A	VE01		0	
3108	ORGANIC PEROXIDE TYPE E, SOLID	5.2	P1		5.2	122 274	LQ11 E0		PP, EX, A	VE01		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3109	ORGANIC PEROXIDE TYPE F, LIQUID	5.2	P1		5.2	122 274	LQ16	E0	PP, EX, A	VE01		0	
3110	ORGANIC PEROXIDE TYPE F, SOLID	5.2	P1		5.2	122 274	LQ11	E0	PP, EX, A	VE01		0	
3111	ORGANIC PEROXIDE TYPE B, LIQUID, TEMPERATURE CONTROLLED	5.2	P2		5.2+1	122 181 274	LQ0	E0	PP, EX, A	VE01	HA01, HA10	3	
3112	ORGANIC PEROXIDE TYPE B, SOLID, TEMPERATURE CONTROLLED	5.2	P2		5.2+1	122 181 274	LQ0	E0	PP, EX, A	VE01	HA01, HA10	3	
3113	ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED	5.2	P2		5.2	122 274	LQ0	E0	PP, EX, A	VE01		0	
3114	ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED	5.2	P2		5.2	122 274	LQ0	E0	PP, EX, A	VE01		0	
3115	ORGANIC PEROXIDE TYPE D, LIQUID, TEMPERATURE CONTROLLED	5.2	P2		5.2	122 274	LQ0	E0	PP, EX, A	VE01		0	
3116	ORGANIC PEROXIDE TYPE D, SOLID, TEMPERATURE CONTROLLED	5.2	P2		5.2	122 274	LQ0	E0	PP, EX, A	VE01		0	
3117	ORGANIC PEROXIDE TYPE E, LIQUID, TEMPERATURE CONTROLLED	5.2	P2		5.2	122 274	LQ0	E0	PP, EX, A	VE01		0	
3118	ORGANIC PEROXIDE TYPE E, SOLID, TEMPERATURE CONTROLLED	5.2	P2		5.2	122 274	LQ0	E0	PP, EX, A	VE01		0	
3119	ORGANIC PEROXIDE TYPE F, LIQUID, TEMPERATURE CONTROLLED	5.2	P2		5.2	122 274	LQ0	E0	PP, EX, A	VE01		0	
3120	ORGANIC PEROXIDE TYPE F, SOLID, TEMPERATURE CONTROLLED	5.2	P2		5.2	122 274	LQ0	E0	PP, EX, A	VE01		0	
3121	OXIDIZING SOLID, WATER-REACTIVE, N.O.S.	5.1	OW										
CARRIAGE PROHIBITED													
3122	TOXIC LIQUID, OXIDIZING, N.O.S.	6.1	TO1	I	6.1+5.1	274 315 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3122	TOXIC LIQUID, OXIDIZING, N.O.S.	6.1	TO1	II	6.1+5.1	274 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3123	TOXIC LIQUID, WATER-REACTIVE, N.O.S.	6.1	TW1	I	6.1+4.3	274 315 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3123	TOXIC LIQUID, WATER-REACTIVE, N.O.S.	6.1	TW1	II	6.1+4.3	274 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3124	TOXIC SOLID, SELF-HEATING, N.O.S.	6.1	TS	I	6.1+4.2	274 802	LQ0	E5	PP, EP			2	
3124	TOXIC SOLID, SELF-HEATING, N.O.S.	6.1	TS	II	6.1+4.2	274 802	LQ18	E4	PP, EP			2	
3125	TOXIC SOLID, WATER-REACTIVE, N.O.S.	6.1	TW2	I	6.1+4.3	274 802	LQ0	E5	PP, EP			2	
3125	TOXIC SOLID, WATER-REACTIVE, N.O.S.	6.1	TW2	II	6.1+4.3	274 802	LQ18	E4	PP, EP			2	

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(1)	3.1.2 (2)	2.2 (3b)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3126	SELF-HEATING SOLID, CORROSIVE, ORGANIC, N.O.S.	4.2	SC2	II	4.2+8	274	LQ0 E2		PP			0	
3126	SELF-HEATING SOLID, CORROSIVE, ORGANIC, N.O.S.	4.2	SC2	III	4.2+8	274	LQ0 E1		PP			0	
3127	SELF-HEATING SOLID, OXIDIZING, N.O.S.	4.2	SO										
3128	SELF-HEATING SOLID, TOXIC, ORGANIC, N.O.S.	4.2	ST2	II	4.2+6.1	274	LQ0 E2		PP			2	
3128	SELF-HEATING SOLID, TOXIC, ORGANIC, N.O.S.	4.2	ST2	III	4.2+6.1	274	LQ0 E1		PP			0	
3129	WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.	4.3	WC1	I	4.3+8	274	LQ0 E0		PP, EP, EX, A	VE01	HA08	0	
3129	WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.	4.3	WC1	II	4.3+8	274	LQ10 E2		PP, EP, EX, A	VE01	HA08	0	
3129	WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.	4.3	WC1	III	4.3+8	274	LQ13 E1		PP, EP, EX, A	VE01	HA08	0	
3130	WATER-REACTIVE LIQUID, TOXIC, N.O.S.	4.3	WT1	I	4.3+6.1	274	LQ0 E0		PP, EP, EX, TOX, A	VE01, VE02	HA08	2	
3130	WATER-REACTIVE LIQUID, TOXIC, N.O.S.	4.3	WT1	II	4.3+6.1	274	LQ10 E2		PP, EP, EX, TOX, A	VE01, VE02	HA08	2	
3130	WATER-REACTIVE LIQUID, TOXIC, N.O.S.	4.3	WT1	III	4.3+6.1	274	LQ13 E1		PP, EP, EX, TOX, A	VE01, VE02	HA08	0	
3131	WATER-REACTIVE SOLID, CORROSIVE, N.O.S.	4.3	WC2	I	4.3+8	274	LQ0 E0		PP, EP, EX, A	VE01	HA08	0	
3131	WATER-REACTIVE SOLID, CORROSIVE, N.O.S.	4.3	WC2	II	4.3+8	274	LQ11 E2		PP, EP, EX, A	VE01	HA08	0	
3131	WATER-REACTIVE SOLID, CORROSIVE, N.O.S.	4.3	WC2	III	4.3+8	274	LQ12 E1		PP, EP, EX, A	VE01	HA08	0	
3132	WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.	4.3	WF2	I	4.3 + 4.1	274	LQ0 E0		PP, EX, A	VE01		1	
3132	WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.	4.3	WF2	II	4.3 + 4.1	274	LQ11 E2		PP, EX, A	VE01		1	
3132	WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.	4.3	WF2	III	4.3 + 4.1	274	LQ12 E1		PP, EX, A	VE01		0	
3133	WATER-REACTIVE SOLID, OXIDIZING, N.O.S.	4.3	WO										
3134	WATER-REACTIVE SOLID, TOXIC, N.O.S.	4.3	WT2	I	4.3+6.1	274	LQ0 E0		PP, EP, EX, A	VE01	HA08	2	
3134	WATER-REACTIVE SOLID, TOXIC, N.O.S.	4.3	WT2	II	4.3+6.1	274	LQ11 E2		PP, EP, EX, A	VE01	HA08	2	
3134	WATER-REACTIVE SOLID, TOXIC, N.O.S.	4.3	WT2	III	4.3+6.1	274	LQ12 E1		PP, EP, EX, A	VE01	HA08	0	
3135	WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.	4.3	WS	I	4.3 + 4.2	274	LQ0 E0		PP, EX, A	VE01		0	
3135	WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.	4.3	WS	II	4.3 + 4.2	274	LQ11 E2		PP, EX, A	VE01		0	

CARRIAGE PROHIBITED

CARRIAGE PROHIBITED

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3135	WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.	4.3	WS	III	4.3 + 4.2	274	LQ12	E1	PP, EX, A	VE01		0	
3136	TRIFLUOROMETHANE, REFRIGERATED LIQUID	2	3A		2.2	593	LQ1	E1	PP			0	
3137	OXIDIZING SOLID, FLAMMABLE, N.O.S.	5.1	OF						CARRIAGE PROHIBITED				
3138	ETHYLENE, ACETYLENE AND PROPYLENE MIXTURE, REFRIGERATED LIQUID containing at least 71.5% ethylene with not more than 22.5% acetylene and not more than 6% propylene	2	3F		2.1		LQ0	E0	PP, EX, A	VE01		1	
3139	OXIDIZING LIQUID, N.O.S.	5.1	O1	I	5.1	274	LQ0	E0	PP			0	
3139	OXIDIZING LIQUID, N.O.S.	5.1	O1	II	5.1	274	LQ10	E2	PP			0	
3139	OXIDIZING LIQUID, N.O.S.	5.1	O1	III	5.1	274	LQ13	E1	PP			0	
3140	ALKALOIDS, LIQUID, N.O.S. or ALKALOID SALTS, LIQUID, N.O.S.	6.1	T1	I	6.1	43 274	LQ0	E5	PP, EP, TOX, A	VE02		2	
3140	ALKALOIDS, LIQUID, N.O.S. or ALKALOID SALTS, LIQUID, N.O.S.	6.1	T1	II	6.1	43 274 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3140	ALKALOIDS, LIQUID, N.O.S. or ALKALOID SALTS, LIQUID, N.O.S.	6.1	T1	III	6.1	43 274 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3141	ANTIMONY COMPOUND, INORGANIC, LIQUID, N.O.S.	6.1	T4	III	6.1	45 274 512 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3142	DISINFECTANT, LIQUID, TOXIC, N.O.S.	6.1	T1	I	6.1	274 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3142	DISINFECTANT, LIQUID, TOXIC, N.O.S.	6.1	T1	II	6.1	274 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3142	DISINFECTANT, LIQUID, TOXIC, N.O.S.	6.1	T1	III	6.1	274 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3143	DYE, SOLID, TOXIC, N.O.S. or DYE INTERMEDIATE, SOLID, TOXIC, N.O.S.	6.1	T2	I	6.1	274 802	LQ0	E5	PP, EP			2	
3143	DYE, SOLID, TOXIC, N.O.S. or DYE INTERMEDIATE, SOLID, TOXIC, N.O.S.	6.1	T2	II	6.1	274 802	LQ18	E4	PP, EP			2	
3143	DYE, SOLID, TOXIC, N.O.S. or DYE INTERMEDIATE, SOLID, TOXIC, N.O.S.	6.1	T2	III	6.1	274 802	LQ9	E1	PP, EP			0	
3144	NICOTINE COMPOUND, LIQUID, N.O.S. or NICOTINE PREPARATION, LIQUID, N.O.S.	6.1	T1	I	6.1	43 274 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3144	NICOTINE COMPOUND, LIQUID, N.O.S. or NICOTINE PREPARATION, LIQUID, N.O.S.	6.1	T1	II	6.1	43 274 802	LQ17	E4	PP, EP, TOX, A	VE02		2	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
3144	NICOTINE COMPOUND, LIQUID, N.O.S. or NICOTINE PREPARATION, LIQUID, N.O.S.	6.1	T1	III	6.1	43 274 802	LQ7 E1		PP, EP, TOX, A	VE02		0	
3145	ALKYLPHENOLS, LIQUID, N.O.S. (including C ₂ -C ₁₂ homologues)	8	C3	I	8	274	LQ0 E0		PP, EP			0	
3145	ALKYLPHENOLS, LIQUID, N.O.S. (including C ₂ -C ₁₂ homologues)	8	C3	II	8	274	LQ22 E2	T	PP, EP			0	
3145	ALKYLPHENOLS, LIQUID, N.O.S. (including C ₂ -C ₁₂ homologues)	8	C3	III	8	274	LQ7 E1	T	PP, EP			0	
3146	ORGANOTIN COMPOUND, SOLID, N.O.S.	6.1	T3	I	6.1	43 274 802	LQ0 E5		PP, EP			2	
3146	ORGANOTIN COMPOUND, SOLID, N.O.S.	6.1	T3	II	6.1	43 274 802	LQ18 E4		PP, EP			2	
3146	ORGANOTIN COMPOUND, SOLID, N.O.S.	6.1	T3	III	6.1	43 274 802	LQ9 E1		PP, EP			0	
3147	DYE, SOLID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, SOLID, CORROSIVE, N.O.S.	8	C10	I	8	274	LQ0 E0		PP, EP			0	
3147	DYE, SOLID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, SOLID, CORROSIVE, N.O.S.	8	C10	II	8	274	LQ23 E2		PP, EP			0	
3147	DYE, SOLID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, SOLID, CORROSIVE, N.O.S.	8	C10	III	8	274	LQ24 E1		PP, EP			0	
3148	WATER-REACTIVE LIQUID, N.O.S.	4.3	W1	I	4.3	274	LQ0 E0		PP, EX, A	VE01	HA08	0	
3148	WATER-REACTIVE LIQUID, N.O.S.	4.3	W1	II	4.3	274	LQ10 E2		PP, EX, A	VE01	HA08	0	
3148	WATER-REACTIVE LIQUID, N.O.S.	4.3	W1	III	4.3	274	LQ13 E1		PP, EX, A	VE01	HA08	0	
3149	HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURE with acid(s), water and not more than 5% peroxyacetic acid, STABILIZED	5.1	OC1	II	5.1+8	196 553	LQ10 E2		PP, EP			0	
3150	DEVICES, SMALL, HYDROCARBON GAS POWERED or HYDROCARBON GAS REFILLS FOR SMALL DEVICES with release device	2	6F		2.1		LQ0 E0		PP, EX, A	VE01		1	
3151	POLYHALOGENATED BIPHENYLS, LIQUID or POLYHALOGENATED TERPHENYLS, LIQUID	9	M2	II	9	203 305 802	LQ26 E2		PP, EP			0	
3152	POLYHALOGENATED BIPHENYLS, SOLID or POLYHALOGENATED TERPHENYLS, SOLID	9	M2	II	9	203 305 802	LQ25 E2		PP, EP			0	
3153	PERFLUORO/METHYL VINYL ETHER	2	2F		2.1		LQ0 E0		PP, EX, A	VE01		1	
3154	PERFLUORO/ETHYL VINYL ETHER	2	2F		2.1		LQ0 E0		PP, EX, A	VE01		1	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3155	PENTACHLOROPHENOL	6.1	T2	II	6.1	43 802	LQ18	E4	PP, EP			2	
3156	COMPRESSED GAS, OXIDIZING, N.O.S.	2	IO		2.2+5.1	274	LQ0	E0	PP			0	
3157	LIQUEFIED GAS, OXIDIZING, N.O.S.	2	20		2.2+5.1	274	LQ0	E0	PP			0	
3158	GAS, REFRIGERATED LIQUID, N.O.S.	2	3A		2.2	274	LQ1	E1	PP			0	
3159	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R134a)	2	2A		2.2	593	LQ1	E1	PP			0	
3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.	2	2TF		2.3+2.1	274	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
3161	LIQUEFIED GAS, FLAMMABLE, N.O.S.	2	2F		2.1	274	LQ0	E0	PP, EX, A	VE01		1	
3162	LIQUEFIED GAS, TOXIC, N.O.S.	2	2T		2.3	274	LQ0	E0	PP, EP, TOX, A	VE02		2	
3163	LIQUEFIED GAS, N.O.S.	2	2A		2.2	274	LQ1	E1	PP			0	
3164	ARTICLES, PRESSURIZED, PNEUMATIC or HYDRAULIC (containing non-flammable gas)	2	6A		2.2	283 594	LQ0	E0	PP			0	
3165	AIRCRAFT HYDRAULIC POWER UNIT FUEL TANK (containing a mixture of anhydrous hydrazine and methylhydrazine) (M86 fuel)	3	FTC	I	3+6.1+8	802	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
3166	Engine, internal combustion or vehicle, flammable gas powered or vehicle, flammable liquid powered	9	M11										
3167	GAS SAMPLE, NON-PRESSURIZED, FLAMMABLE, N.O.S., not refrigerated liquid	2	7F		2.1	274	LQ0	E0	PP, EX, A	VE01		1	
3168	GAS SAMPLE, NON-PRESSURIZED, TOXIC, FLAMMABLE, N.O.S., not refrigerated liquid	2	7TF		2.3+2.1	274	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
3169	GAS SAMPLE, NON-PRESSURIZED, TOXIC, N.O.S., not refrigerated liquid	2	7T		2.3	274	LQ0	E0	PP, EP, TOX, A	VE02		2	
3170	ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS	4.3	W2	II	4.3	244	LQ11	E2	PP, EX, A	VE01	HA08	0	
3170	ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS	4.3	W2	III	4.3	244	LQ12	E1	PP, EX, A	VE01, VE03	LO03 HA07, HA08 IN01, IN02, IN03	0	VE03, LO03, HA07, IN01, IN02 and IN03 apply only when this substance is carried in bulk or without packaging
3171	Battery-powered vehicle or Battery-powered equipment	9	M11										
3172	TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S.	6.1	T1	I	6.1	210 274 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3172	TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S.	6.1	T1	II	6.1	210 274 802	LQ17	E4	PP, EP, TOX, A	VE02		2	

NOT SUBJECT TO ADN

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3172	TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S.	6.1	T1	III	6.1	210 274 802	LQ7 E1		PP, EP, TOX, A	VE02		0	
3174	TITANIUM DISULPHIDE	4.2	S4	III	4.2	802	LQ0		PP			0	
3175	SOLIDS or mixtures of solids (such as preparations and wastes) CONTAINING FLAMMABLE LIQUID, N.O.S. having a flash-point up to 60°C	4.1	F1	II	4.1	216 274 800	LQ8 E2	B	PP, EX, A	VE01, VE03	IN01, IN02	1	VE03, IN01 and IN02 apply only when this substance is carried in bulk or without packaging
3175	SOLIDS CONTAINING FLAMMABLE LIQUID MOLTEN, having a flash-point up to 60°C (DIALKYL-(C ₁₂ -C ₁₈)-DIMETHYL-AMMONIUM and 2-PROPANOL)	4.1	F1	II	4.1	216 274 800	LQ8 E2	T	PP, EX, A	VE01, VE03	IN01, IN02	1	VE03, IN01 and IN02 apply only when this substance is carried in bulk or without packaging
3176	FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.	4.1	F2	II	4.1	274	LQ0 E0		PP			0	
3176	FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.	4.1	F2	III	4.1	274	LQ0 E0		PP			0	
3178	FLAMMABLE SOLID, INORGANIC, N.O.S.	4.1	F3	II	4.1	274	LQ8 E2		PP			1	
3178	FLAMMABLE SOLID, INORGANIC, N.O.S.	4.1	F3	III	4.1	274	LQ9 E1		PP			0	
3179	FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S.	4.1	FT2	II	4.1+6.1	274 802	LQ0 E2		PP			2	
3179	FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S.	4.1	FT2	III	4.1+6.1	274 802	LQ0 E1		PP			0	
3180	FLAMMABLE SOLID, CORROSIVE, INORGANIC, N.O.S.	4.1	FC2	II	4.1+8	274	LQ0 E2		PP			1	
3180	FLAMMABLE SOLID, CORROSIVE, INORGANIC, N.O.S.	4.1	FC2	III	4.1+8	274	LQ0 E1		PP			0	
3181	METAL SALTS OF ORGANIC COMPOUNDS, FLAMMABLE, N.O.S.	4.1	F3	II	4.1	274	LQ8 E2		PP			1	
3181	METAL SALTS OF ORGANIC COMPOUNDS, FLAMMABLE, N.O.S.	4.1	F3	III	4.1	274	LQ9 E1		PP			0	
3182	METAL HYDRIDES, FLAMMABLE, N.O.S.	4.1	F3	II	4.1	274 554	LQ8 E2		PP			1	
3182	METAL HYDRIDES, FLAMMABLE, N.O.S.	4.1	F3	III	4.1	274 554	LQ9 E1		PP			0	
3183	SELF-HEATING LIQUID, ORGANIC, N.O.S.	4.2	S1	II	4.2	274	LQ0 E2		PP			0	
3183	SELF-HEATING LIQUID, ORGANIC, N.O.S.	4.2	S1	III	4.2	274	LQ0 E1		PP			0	
3184	SELF-HEATING LIQUID, TOXIC, ORGANIC, N.O.S.	4.2	ST1	II	4.2+6.1	274 802	LQ0 E2		PP, EP, TOX, A	VE02		2	
3184	SELF-HEATING LIQUID, TOXIC, ORGANIC, N.O.S.	4.2	ST1	III	4.2+6.1	274 802	LQ0 E1		PP, EP, TOX, A	VE02		0	
3185	SELF-HEATING LIQUID, CORROSIVE, ORGANIC, N.O.S.	4.2	SC1	II	4.2+8	274	LQ0 E2		PP, EP			0	
3185	SELF-HEATING LIQUID, CORROSIVE, ORGANIC, N.O.S.	4.2	SC1	III	4.2+8	274	LQ0 E1		PP, EP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3186	SELF-HEATING LIQUID, INORGANIC, N.O.S.	4.2	S3	II	4.2	274	LQ0	E2	PP			0	
3186	SELF-HEATING LIQUID, INORGANIC, N.O.S.	4.2	S3	III	4.2	274	LQ0	E1	PP			0	
3187	SELF-HEATING LIQUID, TOXIC, INORGANIC, N.O.S.	4.2	ST3	II	4.2+6.1	274	LQ0	E2	PP, EP, TOX, A	VE02		2	
3187	SELF-HEATING LIQUID, TOXIC, INORGANIC, N.O.S.	4.2	ST3	III	4.2+6.1	274	LQ0	E1	PP, EP, TOX, A	VE02		0	
3188	SELF-HEATING LIQUID, CORROSIVE, INORGANIC, N.O.S.	4.2	SC3	II	4.2+8	274	LQ0	E2	PP, EP			0	
3188	SELF-HEATING LIQUID, CORROSIVE, INORGANIC, N.O.S.	4.2	SC3	III	4.2+8	274	LQ0	E1	PP, EP			0	
3189	METAL POWDER, SELF-HEATING, N.O.S.	4.2	S4	II	4.2	274	LQ0	E2	PP			0	
3189	METAL POWDER, SELF-HEATING, N.O.S.	4.2	S4	III	4.2	274	LQ0	E1	PP			0	
3190	SELF-HEATING SOLID, INORGANIC, N.O.S.	4.2	S4	II	4.2	274	LQ0	E2	PP			0	
3190	SELF-HEATING SOLID, INORGANIC, N.O.S.	4.2	S4	III	4.2	274	LQ0	E1	PP			0	
3191	SELF-HEATING SOLID, TOXIC, INORGANIC, N.O.S.	4.2	ST4	II	4.2+6.1	274	LQ0	E2	PP			2	
3191	SELF-HEATING SOLID, TOXIC, INORGANIC, N.O.S.	4.2	ST4	III	4.2+6.1	274	LQ0	E1	PP			0	
3192	SELF-HEATING SOLID, CORROSIVE, INORGANIC, N.O.S.	4.2	SC4	II	4.2+8	274	LQ0	E2	PP			0	
3192	SELF-HEATING SOLID, CORROSIVE, INORGANIC, N.O.S.	4.2	SC4	III	4.2+8	274	LQ0	E1	PP			0	
3194	PYROPHORIC LIQUID, INORGANIC, N.O.S.	4.2	S3	I	4.2	274	LQ0	E0	PP			0	
3200	PYROPHORIC SOLID, INORGANIC, N.O.S.	4.2	S4	I	4.2	274	LQ0	E0	PP			0	
3205	ALKALINE EARTH METAL ALCOHOLATES, N.O.S.	4.2	S4	II	4.2	183	LQ0	E2	PP			0	
3205	ALKALINE EARTH METAL ALCOHOLATES, N.O.S.	4.2	S4	III	4.2	183	LQ0	E1	PP			0	
3206	ALKALI METAL ALCOHOLATES, SELF-HEATING, CORROSIVE, N.O.S.	4.2	SC4	II	4.2+8	182	LQ0	E2	PP			0	
3206	ALKALI METAL ALCOHOLATES, SELF-HEATING, CORROSIVE, N.O.S.	4.2	SC4	III	4.2+8	183	LQ0	E1	PP			0	
3208	METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.	4.3	W2	I	4.3	274	LQ0	E0	PP, EX, A	VE01	HA08	0	
3208	METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.	4.3	W2	II	4.3	274	LQ11	E2	PP, EX, A	VE01	HA08	0	
3208	METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.	4.3	W2	III	4.3	274	LQ12	E1	PP, EX, A	VE01	HA08	0	
3209	METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.	4.3	WS	I	4.3+4.2	274	LQ0	E0	PP, EX, A	VE01	HA08	0	
3209	METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.	4.3	WS	II	4.3+4.2	274	LQ11	E2	PP, EX, A	VE01	HA08	0	
3209	METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.	4.3	WS	III	4.3+4.2	274	LQ12	E1	PP, EX, A	VE01	HA08	0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3210	CHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	O1	II	5.1	274 605	LQ10 E2		PP			0	
3210	CHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	O1	III	5.1	274 605	LQ13 E1		PP			0	
3211	PERCHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	O1	II	5.1	274	LQ10 E2		PP			0	
3211	PERCHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	O1	III	5.1	274	LQ13 E1		PP			0	
3212	HYPOCHLORITES, INORGANIC, N.O.S.	5.1	O2	II	5.1	274	LQ11 E2		PP			0	
3213	BROMATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	O1	II	5.1	274 559	LQ10 E2		PP			0	
3213	BROMATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	O1	III	5.1	274 604	LQ13 E1		PP			0	
3214	PERMANGANATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	O1	II	5.1	274	LQ10 E2		PP			0	
3215	PERSULPHATES, INORGANIC, N.O.S.	5.1	O2	III	5.1	274	LQ12 E1		PP			0	
3216	PERSULPHATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	O1	III	5.1	274	LQ13 E1		PP			0	
3218	NITRATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	O1	II	5.1	270 274 511	LQ10 E2		PP			0	
3218	NITRATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	O1	III	5.1	270 274 511	LQ13 E1		PP			0	
3219	NITRITES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	O1	II	5.1	103 274	LQ10 E2		PP			0	
3219	NITRITES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	O1	III	5.1	103 274	LQ13 E1		PP			0	
3220	PENTAFLUOROETHANE (REFRIGERANT GAS R 125)	2	2A		2.2		LQ1 E1		PP			0	
3221	SELF-REACTIVE LIQUID TYPE B	4.1	SR1		4.1+1	181 194 274	LQ14 E0		PP		HA01, HA10	3	
3222	SELF-REACTIVE SOLID TYPE B	4.1	SR1		4.1+1	181 194 274	LQ15 E0		PP		HA01, HA10	3	
3223	SELF-REACTIVE LIQUID TYPE C	4.1	SR1		4.1	194 274	LQ14 E0		PP			0	
3224	SELF-REACTIVE SOLID TYPE C	4.1	SR1		4.1	194 274	LQ15 E0		PP			0	
3225	SELF-REACTIVE LIQUID TYPE D	4.1	SR1		4.1	194 274	LQ16 E0		PP			0	
3226	SELF-REACTIVE SOLID TYPE D	4.1	SR1		4.1	194 274	LQ11 E0		PP			0	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3227	SELF-REACTIVE LIQUID TYPE E	4.1	SR1		4.1	194 274	LQ16 E0		PP			0	
3228	SELF-REACTIVE SOLID TYPE E	4.1	SR1		4.1	194 274	LQ11 E0		PP			0	
3229	SELF-REACTIVE LIQUID TYPE F	4.1	SR1		4.1	194 274	LQ16 E0		PP			0	
3230	SELF-REACTIVE SOLID TYPE F	4.1	SR1		4.1	194 274	LQ11 E0		PP			0	
3231	SELF-REACTIVE LIQUID TYPE B, TEMPERATURE CONTROLLED	4.1	SR2		4.1+1	181 194 274	LQ0 E0		PP		HA01, HA10	3	
3232	SELF-REACTIVE SOLID TYPE B, TEMPERATURE CONTROLLED	4.1	SR2		4.1+1	181 194 274	LQ0 E0		PP		HA01, HA10	3	
3233	SELF-REACTIVE LIQUID TYPE C, TEMPERATURE CONTROLLED	4.1	SR2		4.1	194 274	LQ0 E0		PP			0	
3234	SELF-REACTIVE SOLID TYPE C, TEMPERATURE CONTROLLED	4.1	SR2		4.1	194 274	LQ0 E0		PP			0	
3235	SELF-REACTIVE LIQUID TYPE D, TEMPERATURE CONTROLLED	4.1	SR2		4.1	194 274	LQ0 E0		PP			0	
3236	SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED	4.1	SR2		4.1	194 274	LQ0 E0		PP			0	
3237	SELF-REACTIVE LIQUID TYPE E, TEMPERATURE CONTROLLED	4.1	SR2		4.1	194 274	LQ0 E0		PP			0	
3238	SELF-REACTIVE SOLID TYPE E, TEMPERATURE CONTROLLED	4.1	SR2		4.1	194 274	LQ0 E0		PP			0	
3239	SELF-REACTIVE LIQUID TYPE F, TEMPERATURE CONTROLLED	4.1	SR2		4.1	194 274	LQ0 E0		PP			0	
3240	SELF-REACTIVE SOLID TYPE F, TEMPERATURE CONTROLLED	4.1	SR2		4.1	194 274	LQ0 E0		PP			0	
3241	2-BROMO-2-NITROPROPANE-1,3-DIOL	4.1	SR1	III	4.1	638	LQ0		PP			0	
3242	AZODICARBONAMIDE	4.1	SR1	II	4.1	215 638	LQ0 E2		PP			0	
3243	SOLIDS CONTAINING TOXIC LIQUID, N.O.S.	6.1	T9	II	6.1	217 274 802	LQ18 E4		PP, EP, TOX, A	VE02		2	
3244	SOLIDS CONTAINING CORROSIVE LIQUID, N.O.S.	8	C10	II	8	218 274	LQ23 E2		PP, EP			0	
3245	GENETICALLY MODIFIED MICROORGANISMS or GENETICALLY MODIFIED ORGANISMS	9	M8		9	637 802	LQ0 E0		PP			0	
3245	GENETICALLY MODIFIED MICROORGANISMS or GENETICALLY MODIFIED ORGANISMS, in refrigerated liquid nitrogen	9	M8		9+2.2	637 802	LQ0 E0		PP			0	
3246	METHANESULPHONYL CHLORIDE	6.1	TC1	I	6.1+8	802	LQ0 E5		PP, EP, TOX, A	VE02		2	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	(13)
3247	SODIUM PEROXOBORATE, ANHYDROUS	5.1	O2	II	5.1		LQ11	E2	PP			0	
3248	MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S.	3	FT1	II	3+6.1	220 221 274 601 802	LQ0	E2	PP, EP, EX, TOX, A	VE01, VE02		2	
3248	MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S.	3	FT1	III	3+6.1	220 221 274 601 802	LQ7	E1	PP, EP, EX, TOX, A	VE01, VE02		0	
3249	MEDICINE, SOLID, TOXIC, N.O.S.	6.1	T2	II	6.1	221 274 601 802	LQ18	E4	PP, EP			2	
3249	MEDICINE, SOLID, TOXIC, N.O.S.	6.1	T2	III	6.1	221 274 601 802	LQ9	E1	PP, EP			0	
3250	CHLOROACETIC ACID, MOLTEN	6.1	TC1	II	6.1+8	802	LQ0	E0	PP, EP, TOX, A	VE02		2	
3251	ISOSORBIDE-5-MONONITRATE	4.1	SR1	III	4.1	226 638	LQ0	E1	PP			0	
3252	DIFLUOROMETHANE (REFRIGERANT GAS (R 32))	2	2F		2.1		LQ0	E0	PP, EX, A	VE01		1	
3253	DISODIUM TRIOXOSILICATE	8	C6	III	8		LQ24	E1	PP, EP			0	
3254	TRIBUTYLPHOSPHANE	4.2	S1	I	4.2		LQ0	E0	PP			0	
3255	tert-BUTYL HYPOCHLORITE	4.2	SC1										
3256	ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point	3	F2	III	3	274 560	LQ0	E0	PP, EX, A	VE01		0	
3257	ELEVATED TEMPERATURE LIQUID, N.O.S., at or above 100 °C and below its flash-point (including molten metals, molten salts, etc.)	9	M9	III	9	274 580 643	LQ0	E0	PP			0	
3258	ELEVATED TEMPERATURE SOLID, N.O.S., at or above 240 °C	9	M10	III	9	274 580 643	LQ0	E0	PP			0	
3259	AMINES, SOLID, CORROSIVE, N.O.S. or POLYAMINES, SOLID, CORROSIVE, N.O.S.	8	C8	I	8	274	LQ0	E0	PP, EP			0	
3259	AMINES, SOLID, CORROSIVE, N.O.S. or POLYAMINES, SOLID, CORROSIVE, N.O.S.	8	C8	II	8	274	LQ23	E2	PP, EP			0	
3259	AMINES, SOLID, CORROSIVE, N.O.S. or POLYAMINES, SOLID, CORROSIVE, N.O.S.	8	C8	III	8	274	LQ24	E1	PP, EP			0	
3260	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.	8	C2	I	8	274	LQ0	E0	PP, EP			0	

CARRIAGE PROHIBITED

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3260	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.	8	C2	II	8	274	LQ23		PP, EP			0	
3260	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.	8	C2	III	8	274	LQ24		PP, EP			0	
3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.	8	C4	I	8	274	LQ0		PP, EP			0	
3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.	8	C4	II	8	274	LQ23		PP, EP			0	
3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.	8	C4	III	8	274	LQ24		PP, EP			0	
3262	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S.	8	C6	I	8	274	LQ0		PP, EP			0	
3262	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S.	8	C6	II	8	274	LQ23		PP, EP			0	
3262	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S.	8	C6	III	8	274	LQ24		PP, EP			0	
3263	CORROSIVE SOLID, BASIC, ORGANIC, N.O.S.	8	C8	I	8	274	LQ0		PP, EP			0	
3263	CORROSIVE SOLID, BASIC, ORGANIC, N.O.S.	8	C8	II	8	274	LQ23		PP, EP			0	
3263	CORROSIVE SOLID, BASIC, ORGANIC, N.O.S.	8	C8	III	8	274	LQ24		PP, EP			0	
3264	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8	C1	I	8	274	LQ0	T	PP, EP			0	
3264	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8	C1	II	8	274	LQ22	T	PP, EP			0	
3264	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8	C1	III	8	274	LQ7	T	PP, EP			0	
3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.	8	C3	I	8	274	LQ0	T	PP, EP			0	
3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.	8	C3	II	8	274	LQ22	T	PP, EP			0	
3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.	8	C3	III	8	274	LQ7	T	PP, EP			0	
3266	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	8	C5	I	8	274	LQ0	T	PP, EP			0	
3266	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	8	C5	II	8	274	LQ22	T	PP, EP			0	
3266	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	8	C5	III	8	274	LQ7	T	PP, EP			0	
3267	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	8	C7	I	8	274	LQ0	T	PP, EP			0	
3267	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	8	C7	II	8	274	LQ22	T	PP, EP			0	
3267	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	8	C7	III	8	274	LQ7	T	PP, EP			0	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3268	AIR BAG INFLATORS or AIR BAG MODULES or SEAT-BELT PRETENSIONERS	9	M5	III	9	280 289	LQ0	E0	PP			0	
3269	POLYESTER RESIN KIT	3	F1	II	3	236 340	LQ6	E0	PP, EX, A	VE01		1	
3269	POLYESTER RESIN KIT	3	F1	III	3	236 340	LQ7	E0	PP, EX, A	VE01		0	
3270	NITROCELLULOSE MEMBRANE FILTERS, with not more than 12.6% nitrogen, by dry mass	4.1	F1	II	4.1	237 286	LQ8	E2	PP			1	
3271	ETHERS, N.O.S.	3	F1	II	3	274	LQ4	E2	PP, EX, A	VE01		1	
3271	ETHERS, N.O.S.	3	F1	III	3	274	LQ7	E1	PP, EX, A	VE01		0	
3272	ESTERS, N.O.S.	3	F1	II	3	274 601	LQ4	E2	PP, EX, A	VE01		1	
3272	ESTERS, N.O.S.	3	F1	III	3	274 601	LQ7	E1	PP, EX, A	VE01		0	
3273	NITRILES, FLAMMABLE, TOXIC, N.O.S.	3	FT1	I	3+6.1	274 802	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
3273	NITRILES, FLAMMABLE, TOXIC, N.O.S.	3	FT1	II	3+6.1	274 802	LQ0	E2	PP, EP, EX, TOX, A	VE01, VE02		2	
3274	ALCOHOLATES SOLUTION, N.O.S., in alcohol	3	FC	II	3+8	274	LQ4	E2	PP, EP, EX, A	VE01		1	
3275	NITRILES, TOXIC, FLAMMABLE, N.O.S.	6.1	TF1	I	6.1+3	274 315 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
3275	NITRILES, TOXIC, FLAMMABLE, N.O.S.	6.1	TF1	II	6.1+3	274 802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
3276	NITRILES, TOXIC, LIQUID, N.O.S.	6.1	T1	I	6.1	274 315 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3276	NITRILES, TOXIC, LIQUID, N.O.S.	6.1	T1	II	6.1	274 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3276	NITRILES, TOXIC, LIQUID, N.O.S.	6.1	T1	III	6.1	274 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3277	CHLOROFORMATES, TOXIC, CORROSIVE, N.O.S.	6.1	TC1	II	6.1+8	274 561 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3278	ORGANOPHOSPHORUS COMPOUND, TOXIC, LIQUID, N.O.S.	6.1	T1	I	6.1	43 274 315 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3278	ORGANOPHOSPHORUS COMPOUND, TOXIC, LIQUID, N.O.S.	6.1	T1	II	6.1	43 274 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3278	ORGANOPHOSPHORUS COMPOUND, TOXIC, LIQUID, N.O.S.	6.1	T1	III	6.1	43 274 802	LQ7	E1	PP, EP, TOX, A	VE02		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3279	ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE, N.O.S.	6.1	TF1	I	6.1+3	43 274 315 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
3279	ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE, N.O.S.	6.1	TF1	II	6.1+3	43 274 802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
3280	ORGANOARSENIC COMPOUND, LIQUID, N.O.S.	6.1	T3	I	6.1	274 315 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3280	ORGANOARSENIC COMPOUND, LIQUID, N.O.S.	6.1	T3	II	6.1	274 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3280	ORGANOARSENIC COMPOUND, LIQUID, N.O.S.	6.1	T3	III	6.1	274 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3281	METAL CARBONYLS, LIQUID, N.O.S.	6.1	T3	I	6.1	274 315 562 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3281	METAL CARBONYLS, LIQUID, N.O.S.	6.1	T3	II	6.1	274 562 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3281	METAL CARBONYLS, LIQUID, N.O.S.	6.1	T3	III	6.1	274 562 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3282	ORGANOMETALLIC COMPOUND, TOXIC, LIQUID, N.O.S.	6.1	T3	I	6.1	274 562 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3282	ORGANOMETALLIC COMPOUND, TOXIC, LIQUID, N.O.S.	6.1	T3	II	6.1	274 562 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3282	ORGANOMETALLIC COMPOUND, TOXIC, LIQUID, N.O.S.	6.1	T3	III	6.1	274 562 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3283	SELENIUM COMPOUND, SOLID, N.O.S.	6.1	T5	I	6.1	274 563 802	LQ0	E5	PP, EP			2	
3283	SELENIUM COMPOUND, SOLID, N.O.S.	6.1	T5	II	6.1	274 563 802	LQ18	E4	PP, EP			2	
3283	SELENIUM COMPOUND, SOLID, N.O.S.	6.1	T5	III	6.1	274 563 802	LQ9	E1	PP, EP			0	
3284	TELLURIUM COMPOUND, N.O.S.	6.1	T5	I	6.1	274 802	LQ0	E5	PP, EP			2	
3284	TELLURIUM COMPOUND, N.O.S.	6.1	T5	II	6.1	274 802	LQ18	E4	PP, EP			2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3284	TELLURIUM COMPOUND, N.O.S.	6.1	T5	III	6.1	274 802	LQ9 E1		PP, EP			0	
3285	VANADIUM COMPOUND, N.O.S.	6.1	T5	I	6.1	274 564 802	LQ0 E5		PP, EP			2	
3285	VANADIUM COMPOUND, N.O.S.	6.1	T5	II	6.1	274 564 802	LQ18 E4		PP, EP			2	
3285	VANADIUM COMPOUND, N.O.S.	6.1	T5	III	6.1	274 564 802	LQ9 E1		PP, EP			0	
3286	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3	FTC	I	3+6.1+8	274 802	LQ0 E0	T	PP, EP, EX, TOX, A	VE01, VE02		2	
3286	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3	FTC	II	3+6.1+8	274 802	LQ0 E2	T	PP, EP, EX, TOX, A	VE01, VE02		2	
3287	TOXIC LIQUID, INORGANIC, N.O.S.	6.1	T4	I	6.1	274 315 802	LQ0 E5	T	PP, EP, TOX, A	VE02		2	
3287	TOXIC LIQUID, INORGANIC, N.O.S.	6.1	T4	II	6.1	274 802	LQ17 E4	T	PP, EP, TOX, A	VE02		2	
3287	TOXIC LIQUID, INORGANIC, N.O.S.	6.1	T4	III	6.1	274 802	LQ7 E1	T	PP, EP, TOX, A	VE02		0	
3288	TOXIC SOLID, INORGANIC, N.O.S.	6.1	T5	I	6.1	274 802	LQ0 E5		PP, EP			2	
3288	TOXIC SOLID, INORGANIC, N.O.S.	6.1	T5	II	6.1	274 802	LQ18 E4		PP, EP			2	
3288	TOXIC SOLID, INORGANIC, N.O.S.	6.1	T5	III	6.1	274 802	LQ9 E1		PP, EP			0	
3289	TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.	6.1	TC3	I	6.1+8	274 315 802	LQ0 E5	T	PP, EP, TOX, A	VE02		2	
3289	TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.	6.1	TC3	II	6.1+8	274 802	LQ17 E4	T	PP, EP, TOX, A	VE02		2	
3290	TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.	6.1	TC4	I	6.1+8	274 802	LQ0 E5		PP, EP			2	
3290	TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.	6.1	TC4	II	6.1+8	274 802	LQ18 E4		PP, EP			2	
3291	CLINICAL WASTE, UNSPECIFIED, N.O.S. or (BIO) MEDICAL WASTE, N.O.S. or REGULATED MEDICAL WASTE, N.O.S.	6.2	I3	II	6.2	565 802	LQ0 E0		PP			0	
3291	CLINICAL WASTE, UNSPECIFIED, N.O.S. or (BIO) MEDICAL WASTE, N.O.S. or REGULATED MEDICAL WASTE, N.O.S. or refrigerated liquid nitrogen	6.2	I3	II	6.2+2.2	565 802	LQ0 E0		PP			0	
3292	BATTERIES, CONTAINING SODIUM, or CELLS, CONTAINING SODIUM	4.3	W3	II	4.3	239 295	LQ0 E0		PP, EX, A	VE01	HA08	0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3293	HYDRAZINE, AQUEOUS SOLUTION with not more than 37% hydrazine, by mass	6.1	T4	III	6.1	566 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3294	HYDROGEN CYANIDE, SOLUTION IN ALCOHOL with not more than 45% hydrogen cyanide	6.1	TF1	I	6.1+3	610 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
3295	HYDROCARBONS, LIQUID, N.O.S.	3	F1	I	3	649	LQ3	E3	PP, EX, A	VE01		1	
3295	HYDROCARBONS, LIQUID, N.O.S. (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	640C 649	LQ4	E2	PP, EX, A	VE01		1	
3295	HYDROCARBONS, LIQUID, N.O.S. (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	640D 649	LQ4	E2	PP, EX, A	VE01		1	
3295	HYDROCARBONS, LIQUID, N.O.S.	3	F1	III	3	649	LQ7	E1	PP, EX, A	VE01		0	
3296	HEPTAFLUOROPROPANE (REFRIGERANT GAS R 227)	2	2A		2.2		LQ1	E1	PP			0	
3297	ETHYLENE OXIDE AND CHLOROTETRAFLUOROETHANE MIXTURE with not more than 8.8% ethylene oxide	2	2A		2.2		LQ1	E1	PP			0	
3298	ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE with not more than 7.9% ethylene oxide	2	2A		2.2		LQ1	E1	PP			0	
3299	ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE with not more than 5.6% ethylene oxide	2	2A		2.2		LQ1	E1	PP			0	
3300	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 87% ethylene oxide	2	2TF		2.3+2.1		LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
3301	CORROSIVE LIQUID, SELF-HEATING, N.O.S.	8	CS1	I	8+4.2	274	LQ0	E0	PP, EP			0	
3301	CORROSIVE LIQUID, SELF-HEATING, N.O.S.	8	CS1	II	8+4.2	274	LQ22	E2	PP, EP			0	
3302	2-DIMETHYLAMINOETHYL ACRYLATE	6.1	T1	II	6.1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3303	COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S.	2	1TO		2.3+5.1	274	LQ0	E0	PP, EP, TOX, A	VE02		2	
3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.	2	1TC		2.3+8	274	LQ0	E0	PP, EP, TOX, A	VE02		2	
3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	2	1TFC		2.3+2.1+8	274	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
3306	COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	2	1TOC		2.3+5.1+8	274	LQ0	E0	PP, EP, TOX, A	VE02		2	
3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.	2	2TO		2.3+5.1	274	LQ0	E0	PP, EP, TOX, A	VE02		2	
3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.	2	2TC		2.3+8	274	LQ0	E0	PP, EP, TOX, A	VE02		2	
3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	2	2TFC		2.3+2.1+8	274	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	2	2TOC		2.3+5.1+8	274	LQ0	E0	PP, EP, TOX, A	VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3311	GAS, REFRIGERATED LIQUID, OXIDIZING, N.O.S.	2	30		2.2+5.1	274	LQ0 E0		PP			0	
3312	GAS, REFRIGERATED LIQUID, FLAMMABLE, N.O.S.	2	3F		2.1	274	LQ0 E0		PP, EX, A	VE01		1	
3313	ORGANIC PIGMENTS, SELF-HEATING	4.2	S2	II	4.2		LQ0 E2		PP			0	
3313	ORGANIC PIGMENTS, SELF-HEATING	4.2	S2	III	4.2		LQ0 E1		PP			0	
3314	PLASTICS MOULDING COMPOUND in dough sheet or extruded rope form evolving flammable vapour	9	M3	III	none	207 633	LQ27 E1		PP, EP, EX, A	VE01		0	
3315	CHEMICAL SAMPLE, TOXIC	6.1	T8	I	6.1	250 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
3316	CHEMICAL KIT or FIRST AID KIT	9	M11	II	9	251 340	LQ0 E0		PP			0	
3316	CHEMICAL KIT or FIRST AID KIT	9	M11	III	9	251 340	LQ0 E0		PP			0	
3317	2-AMINO-4,6-DINITROPHENOL, WETTED with not less than 20% water, by mass	4.1	D	I	4.1		LQ0 E0		PP			1	
3318	AMMONIA SOLUTION, relative density less than 0.880 at 15 °C in water, with more than 50% ammonia	2	4TC		2.3+8	23	LQ0 E0		PP, EP, TOX, A	VE02		2	
3319	NITROGLYCERIN MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 2% but not more than 10% nitroglycerin, by mass	4.1	D	II	4.1	272 274	LQ0 E0		PP			0	
3320	SODIUM BOROHYDRIDE AND SODIUM HYDROXIDE SOLUTION, with not more than 12% sodium borohydride and not more than 40% sodium hydroxide by mass	8	C5	II	8		LQ22 E2		PP, EP			0	
3320	SODIUM BOROHYDRIDE AND SODIUM HYDROXIDE SOLUTION, with not more than 12% sodium borohydride and not more than 40% sodium hydroxide by mass	8	C5	III	8		LQ7 E1		PP, EP			0	
3321	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), non fissile or fissile-excepted	7			7X	172 317 325 336	LQ0 E0		PP			2	
3322	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III), non fissile or fissile-excepted	7			7X	172 317 325 336	LQ0 E0		PP			2	
3323	RADIOACTIVE MATERIAL, TYPE C PACKAGE, non fissile or fissile-excepted	7			7X	172 317	LQ0 E0		PP			2	
3324	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), FISSILE	7			7X+7E	172 326 336	LQ0 E0		PP			2	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
3325	3.1.2 RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY, (LSA-III), FISSILE	7			7X+7E	172 326 336	LQ0 E0		PP	7.1.6	7.1.6	7.1.5	3.2.1
3326	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), FISSILE	7			7X+7E	172 336	LQ0 E0		PP			2	
3327	RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE, non-special form	7			7X+7E	172 326	LQ0 E0		PP			2	
3328	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE	7			7X+7E	172 337	LQ0 E0		PP			2	
3329	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE	7			7X+7E	172 337	LQ0 E0		PP			2	
3330	RADIOACTIVE MATERIAL, TYPE C PACKAGE, FISSILE	7			7X+7E	172	LQ0 E0		PP			2	
3331	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, FISSILE	7			7X+7E	172	LQ0 E0		PP			2	
3332	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, non fissile or fissile-excepted	7			7X	172 317	LQ0 E0		PP			2	
3333	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE	7			7X+7E	172	LQ0 E0		PP			2	
3334	Aviation regulated liquid, n.o.s.	9	M11										
3335	Aviation regulated solid, n.o.s.	9	M11										
3336	MERCAPTANS, LIQUID, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.	3	F1	I	3	274	LQ3 E3		PP, EX, A	VE01		1	
3336	MERCAPTANS, LIQUID, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S. (vapour pressure at 50 °C more than 110 kPa)	3	F1	II	3	274 640C	LQ4 E2		PP, EX, A	VE01		1	
3336	MERCAPTANS, LIQUID, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S. (vapour pressure at 50 °C not more than 110 kPa)	3	F1	II	3	274 640D	LQ4 E2		PP, EX, A	VE01		1	
3336	MERCAPTANS, LIQUID, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.	3	F1	III	3	274	LQ7 E1		PP, EX, A	VE01		0	
3337	REFRIGERANT GAS R 404A (Pentafluoroethane, 1,1,1-trifluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 44% pentafluoroethane and 52% 1,1,1,1-tetrafluoroethane)	2	2A		2.2		LQ1 E1		PP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b) 2A	2.1.1.3 (4)	5.2.2 (5) 2.2	3.3 (6)	3.4.6 (7a) LQ1	3.2.1 (8)	8.1.5 (9) PP	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3338	REFRIGERANT GAS R 407A (Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 20% difluoromethane and 40% pentafluoroethane)	2	2A				E1		PP			0	
3339	REFRIGERANT GAS R 407B (Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 10% difluoromethane and 70% pentafluoroethane)	2	2A		2.2		E1		PP			0	
3340	REFRIGERANT GAS R 407C (Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 23% difluoromethane and 25% pentafluoroethane)	2	2A		2.2		E1		PP			0	
3341	THIOUREA DIOXIDE	4.2	S2	II	4.2		LQ0		PP			0	
3341	THIOUREA DIOXIDE	4.2	S2	III	4.2		LQ0		PP			0	
3342	XANTHATES	4.2	S2	II	4.2		LQ0		PP			0	
3342	XANTHATES	4.2	S2	III	4.2		LQ0		PP			0	
3343	NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, FLAMMABLE, N.O.S. with not more than 30% nitroglycerin, by mass	3	D		3	274 278	LQ0		PP, EX, A	VE01		0	
3344	PENTAERYTHRITOL TETRANITRATE (PENTAERYTHRITOL TETRANITRATE; PETN) MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 10% but not more than 20% PETN, by mass	4.1	D	II	4.1	272 274	LQ0		PP			1	
3345	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1	T7	I	6.1	61 274 648 802	LQ0		PP, EP			2	
3345	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1	T7	II	6.1	61 274 648 802	LQ18		PP, EP			2	
3345	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1	T7	III	6.1	61 274 648 802	LQ9		PP, EP			0	
3346	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274	LQ3		PP, EP, EX, TOX, A	VE01, VE02		2	
3346	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 802	LQ4		PP, EP, EX, TOX, A	VE01, VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3347	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6,1	TF2	I	6.1+3	61 274 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
3347	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6,1	TF2	II	6.1+3	61 274 802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
3347	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6,1	TF2	III	6.1+3	61 274 802	LQ7	E1	PP, EP, EX, TOX, A	VE01, VE02		0	
3348	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC	6,1	T6	I	6,1	61 274 648 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3348	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC	6,1	T6	II	6,1	61 274 648 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3348	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC	6,1	T6	III	6,1	61 274 648 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3349	PYRETHROID PESTICIDE, SOLID, TOXIC	6,1	T7	I	6,1	61 274 648 802	LQ0	E5	PP, EP			2	
3349	PYRETHROID PESTICIDE, SOLID, TOXIC	6,1	T7	II	6,1	61 274 648 802	LQ18	E4	PP, EP			2	
3349	PYRETHROID PESTICIDE, SOLID, TOXIC	6,1	T7	III	6,1	61 274 648 802	LQ9	E1	PP, EP			0	
3350	PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	I	3+6.1	61 274 802	LQ3	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
3350	PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3	FT2	II	3+6.1	61 274 802	LQ4	E2	PP, EP, EX, TOX, A	VE01, VE02		2	
3351	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6,1	TF2	I	6.1+3	61 274 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
3351	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6,1	TF2	II	6.1+3	61 274 802	LQ17	E4	PP, EP, EX, TOX, A	VE01, VE02		2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3351	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	6.1	TF2	III	6.1+3	61 274 802	LQ7 E1		PP, EP, EX, TOX, A	VE01, VE02		0	
3352	PYRETHROID PESTICIDE, LIQUID, TOXIC	6.1	T6	I	6.1	61 274 648 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3352	PYRETHROID PESTICIDE, LIQUID, TOXIC	6.1	T6	II	6.1	61 274 648 802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3352	PYRETHROID PESTICIDE, LIQUID, TOXIC	6.1	T6	III	6.1	61 274 802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3354	INSECTICIDE GAS, FLAMMABLE, N.O.S	2	2F		2.1	274	LQ0	E0	PP, EX, A	VE01		1	
3355	INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.	2	2TF		2.3+2.1	274	LQ0	E0	PP, EP, EX, TOX, A	VE01, VE02		2	
3356	OXYGEN GENERATOR, CHEMICAL	5.1	O3	II	5.1	284	LQ0	E0	PP	VE01		0	
3357	NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, N.O.S. with not more than 30% nitroglycerin, by mass	3	D	II	3	274 288	LQ0	E0	PP, EX, A	VE01		1	
3358	REFRIGERATING MACHINES containing flammable, non-toxic, liquefied gas	2	6F		2.1	291	LQ0	E0	PP, EX, A	VE01		1	
3359	FUMIGATED UNIT	9	M11			302			PP				
3360	Fibres, vegetable, dry	4.1	F1										
3361	CHLOROSILANES, TOXIC, CORROSIVE, N.O.S.	6.1	TC1	II	6.1+8	274 802	LQ0	E4	PP, EP, TOX, A	VE02		2	
3362	CHLOROSILANES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.	6.1	TFC	II	6.1+3+8	274	LQ0	E4	PP, EP, EX, TOX, A	VE01, VE02		2	
3363	Dangerous goods in machinery or dangerous goods in apparatus	9	M11										
3364	TRINITROPHENOL (PICRIC ACID) WETTED with not less than 10% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
3365	TRINITROCHLOROBENZENE (PICRYL CHLORIDE) WETTED with not less than 10% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
3366	TRINITROTOLUENE (TNT), WETTED with not less than 10% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
3367	TRINITROBENZENE, WETTED with not less than 10% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
3368	TRINITROBENZOIC ACID, WETTED with not less than 10% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
3369	SODIUM DINITRO-o-CRESOLATE, WETTED with not less than 10% water, by mass	4.1	DT	I	4.1+6.1	802	LQ0	E0	PP			2	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3370	UREA NITRATE, WETTED with not less than 10% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
3371	2-METHYLBUTANAL	3	F1	II	3		LQ4	E2	PP, EX, A	VE01		1	
3373	BIOLOGICAL SUBSTANCE, CATEGORY F	6.2	I4		6.2	319	LQ0	E0	PP			0	
3373	BIOLOGICAL SUBSTANCE, CATEGORY B (animal material only)	6.2	I4		6.2	319	LQ0	E0	PP			0	
3374	ACETYLENE, SOLVENT FREE	2	2F		2.1		LQ0	E0	PP, EX, A	VE01		1	
3375	AMMONIUM NITRATE EMULSION, or SUSPENSION or GEL, intermediate for blasting explosives, liquid	5.1	O1	II	5.1	309	LQ0	E2	PP			0	
3375	AMMONIUM NITRATE EMULSION, or SUSPENSION or GEL, intermediate for blasting explosives, solid	5.1	O2	II	5.1	309	LQ0	E2	PP			0	
3376	4-NITROPHENYLHYDRAZINE, with not less than 30% water, by mass	4.1	D	I	4.1		LQ0	E0	PP			1	
3377	SODIUM PERBORATE MONOHYDRATE	5.1	O2	III	5.1		LQ12	E1	PP			0	
3378	SODIUM CARBONATE PEROXYHYDRATE	5.1	O2	II	5.1		LQ11	E2	PP			0	
3378	SODIUM CARBONATE PEROXYHYDRATE	5.1	O2	III	5.1		LQ12	E1	PP			0	
3379	DESENSITIZED EXPLOSIVE, LIQUID, N.O.S.	3	D	I	3	274 311	LQ0	E0	PP, EX, A	VE01		1	
3380	DESENSITIZED EXPLOSIVE, SOLID, N.O.S.	4.1	D	I	4.1	274 311	LQ0	E0	PP			1	
3381	TOXIC BY INHALATION LIQUID, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	6.1	T1 or T4	I	6.1	274 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3382	TOXIC BY INHALATION LIQUID, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	6.1	T1 or T4	I	6.1	274 802	LQ0	E5	PP, EP, TOX, A	VE02		2	
3383	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	6.1	TF1	I	6.1 +3	274 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	
3384	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	6.1	TF1	I	6.1 +3	274 802	LQ0	E5	PP, EP, EX, TOX, A	VE01, VE02		2	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3385	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	6.1	TW1	I	6.1 +4.3	274 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
3386	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	6.1	TW1	I	6.1 +4.3	274 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
3387	TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	6.1	TO1	I	6.1 +5.1	274 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
3388	TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	6.1	TO1	I	6.1 +5.1	274 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
3389	TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	6.1	TC1 or TC3	I	6.1 +8	274 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
3390	TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	6.1	TC1 or TC3	I	6.1 +8	274 802	LQ0 E5		PP, EP, TOX, A	VE02		2	
3391	ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC	4.2	S5	I	4.2	274	LQ0 E0		PP			0	
3392	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC	4.2	S5	I	4.2	274	LQ0 E0		PP			0	
3393	ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC, WATER REACTIVE	4.2	SW	I	4.2 +4.3	274	LQ0 E0		PP, EX, A	VE01		0	
3394	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER REACTIVE	4.2	SW	I	4.2 +4.3	274	LQ0 E0		PP, EX, A	VE01		0	
3395	ORGANOMETALLIC SUBSTANCE, SOLID, WATER REACTIVE	4.3	W2	I	4.3	274	LQ0 E0		PP, EX, A	VE01	HA08	0	
3395	ORGANOMETALLIC SUBSTANCE, SOLID, WATER REACTIVE	4.3	W2	II	4.3	274	LQ11		PP, EX, A	VE01	HA08	0	
3395	ORGANOMETALLIC SUBSTANCE, SOLID, WATER REACTIVE	4.3	W2	III	4.3	274	LQ12		PP, EX, A	VE01	HA08	0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3396	ORGANOMETALLIC SUBSTANCE, SOLID, WATER REACTIVE, FLAMMABLE	4.3	WF2	I	4.3+4.1	274	LQ0	E0	PP, EX, A	VE01		1	
3396	ORGANOMETALLIC SUBSTANCE, SOLID, WATER REACTIVE, FLAMMABLE	4.3	WF2	II	4.3+4.1	274	LQ11	E2	PP, EX, A	VE01		1	
3396	ORGANOMETALLIC SUBSTANCE, SOLID, WATER REACTIVE, FLAMMABLE	4.3	WF2	III	4.3+4.1	274	LQ12	E1	PP, EX, A	VE01		0	
3397	ORGANOMETALLIC SUBSTANCE, SOLID, WATER REACTIVE, SELF-HEATING	4.3	WS	I	4.3+4.2	274	LQ0	E0	PP, EX, A	VE01	HA08	0	
3397	ORGANOMETALLIC SUBSTANCE, SOLID, WATER REACTIVE, SELF-HEATING	4.3	WS	II	4.3+4.2	274	LQ11	E2	PP, EX, A	VE01	HA08	0	
3397	ORGANOMETALLIC SUBSTANCE, SOLID, WATER REACTIVE, SELF-HEATING	4.3	WS	III	4.3+4.2	274	LQ12	E1	PP, EX, A	VE01	HA08	0	
3398	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER REACTIVE, SELF-HEATING	4.3	W1	I	4.3	274	LQ0	E0	PP, EX, A	VE01	HA08	0	
3398	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER REACTIVE	4.3	W1	II	4.3	274	LQ10	E2	PP, EX, A	VE01	HA08	0	
3398	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER REACTIVE	4.3	W1	III	4.3	274	LQ13	E1	PP, EX, A	VE01	HA08	0	
3399	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER REACTIVE, FLAMMABLE	4.3	WF1	I	4.3+3	274	LQ0	E0	PP, EX, A	VE01	HA08	1	
3399	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER REACTIVE, FLAMMABLE	4.3	WF1	II	4.3+3	274	LQ10	E2	PP, EX, A	VE01	HA08	1	
3399	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER REACTIVE, FLAMMABLE	4.3	WF1	III	4.3+3	274	LQ13	E1	PP, EX, A	VE01	HA08	0	
3400	ORGANOMETALLIC SUBSTANCE, SOLID, SELF-HEATING	4.2	S5	II	4.2	274	LQ18	E2	PP			0	
3400	ORGANOMETALLIC SUBSTANCE, SOLID, SELF-HEATING	4.2	S5	III	4.2	274	LQ11	E1	PP			0	
3401	ALKALI METAL AMALGAM, SOLID	4.3	W2	I	4.3	182 274	LQ0	E0	PP, EX, A	VE01	HA08	0	
3402	ALKALINE EARTH METAL AMALGAM, SOLID	4.3	W2	I	4.3	183 274 506	LQ0	E0	PP, EX, A	VE01	HA08	0	
3403	POTASSIUM METAL ALLOYS, SOLID	4.3	W2	I	4.3		LQ0	E0	PP, EX, A	VE01	HA08	0	
3404	Potassium sodium alloys, SOLID	4.3	W2	I	4.3		LQ0	E0	PP, EX, A	VE01	HA08	0	
3405	BARIUM CHLORATE SOLUTION	5.1	OT1	II	5.1+6.1	802	LQ10	E2	PP, EP, TOX, A	VE02		2	
3405	BARIUM CHLORATE SOLUTION	5.1	OT1	III	5.1+6.1	802	LQ13	E1	PP, EP, TOX, A	VE02		0	
3406	BARIUM PERCHLORATE SOLUTION	5.1	OT1	II	5.1+6.1	802	LQ10	E2	PP, EP, TOX, A	VE02		2	
3406	BARIUM PERCHLORATE SOLUTION	5.1	OT1	III	5.1+6.1	802	LQ13	E1	PP, EP, TOX, A	VE02		0	
3407	CHLORATE AND MAGNESIUM CHLORIDE MIXTURE SOLUTION	5.1	O1	II	5.1		LQ10	E2	PP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a) 3.5.1.2 (7b)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3407	CHLORATE AND MAGNESIUM CHLORIDE MIXTURE SOLUTION	5.1	OT	III	5.1		LQ13 E1		PP			0	
3408	LEAD PERCHLORATE SOLUTION	5.1	OT1	II	5.1 +6.1		LQ10 E2		PP			0	
3408	LEAD PERCHLORATE SOLUTION	5.1	OT1	III	5.1 +6.1		LQ13 E1		PP			0	
3409	CHLORONITROBENZENES, LIQUID	6.1	T1	II	6.1	279 802	LQ17 E4		PP, EP			2	
3410	4-CHLORO-o-TOLUIDINE HYDROCHLORIDE SOLUTION	6.1	T1	III	6.1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
3411	beta-NAPHTHYLAMINE SOLUTION	6.1	T1	II	6.1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
3411	beta-NAPHTHYLAMINE SOLUTION	6.1	T1	III	6.1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
3412	FORMIC ACID with not less than 10% but not more than 85% acid by mass	8	C3	II	8		LQ22 E2	T	PP, EP			0	
3412	FORMIC ACID with not less than 5% but less than 10% acid by mass	8	C3	III	8		LQ7 E1	T	PP, EP			0	
3413	POTASSIUM CYANIDE SOLUTION	6.1	T4	I	6.1	802	LQ0 E5		PP, EP, TOX, A	VE02		2	
3413	POTASSIUM CYANIDE SOLUTION	6.1	T4	II	6.1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
3413	POTASSIUM CYANIDE SOLUTION	6.1	T4	III	6.1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
3414	SODIUM CYANIDE SOLUTION	6.1	T4	I	6.1	802	LQ0 E5		PP, EP, TOX, A	VE02		2	
3414	SODIUM CYANIDE SOLUTION	6.1	T4	II	6.1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
3414	SODIUM CYANIDE SOLUTION	6.1	T4	III	6.1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
3415	SODIUM FLUORIDE SOLUTION	6.1	T4	III	6.1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
3416	CHLOROACETOPHENONE, LIQUID	6.1	T1	II	6.1	802	LQ17 E4		PP, EP, TOX, A	VE02		2	
3417	XLYL BROMIDE, SOLID	6.1	T2	II	6.1	802	LQ18 E4		PP, EP			2	
3418	2,4-TOLUYLENDIAMINE SOLUTION	6.1	T1	III	6.1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
3419	BORON TRIFLUORIDE ACETIC ACID COMPLEX, SOLID	8	C4	II	8		LQ23 E2		PP, EP			0	
3420	BORON TRIFLUORIDE PROPIONIC ACID COMPLEX, SOLID	8	C4	II	8		LQ23 E2		PP, EP			0	
3421	POTASSIUM HYDROGENDI-FLUORIDE SOLUTION	8	CT1	II	8 +6.1	802	LQ22 E2		PP, EP, TOX, A	VE02		2	
3421	POTASSIUM HYDROGENDI-FLUORIDE SOLUTION	8	CT1	III	8 +6.1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	
3422	POTASSIUM FLUORIDE SOLUTION	6.1	T4	III	6.1	802	LQ7 E1		PP, EP, TOX, A	VE02		0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.5.1.2 (7b)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3423	TETRAMETHYLAMMONIUM HYDROXIDE, SOLID	8	C8	II	8		LQ24	E2	PP, EP			0	
3424	AMMONIUM DINITRO -o-CRESOLATE SOLUTION	6.1	T1	II	6.1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3424	AMMONIUM DINITRO -o-CRESOLATE SOLUTION	6.1	T1	III	6.1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3425	BROMOACETIC ACID, SOLID	8	C4	II	8		LQ23	E2	PP, EP			0	
3426	ACRYLAMIDE SOLUTION	6.1	T1	III	6.1		LQ7	E1	PP, EP, TOX, A	VE02		0	
3427	CHLOROBENZYL CHLORIDES, SOLID	6.1	T2	III	6.1	802	LQ9	E1	PP, EP			0	
3428	3-CHLORO-4-METHYLPHENYL ISOCYANATE, SOLID	6.1	T2	II	6.1	802	LQ18	E4	PP, EP			2	
3429	CHLOROTOLUIDINES, LIQUID	6.1	T1	III	6.1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3430	XYLENOLS, liquid	6.1	T1	II	6.1	802	LQ17	E4	PP, EP, TOX, A	VE02		2	
3431	NITROBENZOTRIFLUORIDES, solid	6.1	T2	II	6.1	802	LQ18	E4	PP, EP			2	
3432	POLYCHLORINATED BIPHENYLS, SOLID	9	M2	II	9	305	LQ25	E2	PP, EP			0	
3434	NITROCRESOLS, liquid	6.1	T1	III	6.1	802	LQ7	E1	PP, EP, TOX, A	VE02		0	
3436	HEXAFLUOROACETONE HYDRATE, SOLID	6.1	T2	II	6.1	802	LQ18	E4	PP, EP			2	
3437	CHLOROCRESOLS, solid	6.1	T2	II	6.1	802	LQ18	E4	PP, EP			2	
3438	alpha-METHYLBENZYL ALCOHOL, SOLID	6.1	T2	III	6.1	802	LQ9	E1	PP, EP			0	
3439	NITRILES, TOXIC, SOLID, N.O.S.	6.1	T2	I	6.1	274	LQ0	E5	PP, EP			2	
3439	NITRILES, TOXIC, SOLID, N.O.S.	6.1	T2	II	6.1	274	LQ18	E4	PP, EP			2	
3439	NITRILES, TOXIC, SOLID, N.O.S.	6.1	T2	III	6.1	274	LQ9	E1	PP, EP			0	
3440	SELENIUM COMPOUND, LIQUID, N.O.S.	6.1	T4	I	6.1	274	LQ0	E5	PP, EP, TOX, A	VE02		2	
3440	SELENIUM COMPOUND, LIQUID, N.O.S.	6.1	T4	II	6.1	274	LQ17	E4	PP, EP, TOX, A	VE02		2	
3440	SELENIUM COMPOUND, LIQUID, N.O.S.	6.1	T4	III	6.1	274	LQ7	E1	PP, EP, TOX, A	VE02		0	
3441	CHLORODINITROBENZENES, SOLID	6.1	T2	II	6.1	279	LQ18	E4	PP, EP			2	
3442	DICHLOROANILINES, SOLID	6.1	T2	II	6.1	279	LQ18	E4	PP, EP			2	
3443	DINITROBENZENES, SOLID	6.1	T2	II	6.1	802	LQ18	E4	PP, EP			2	
3444	NICOTINE HYDROCHLORIDE, SOLID	6.1	T2	II	6.1	43	LQ18	E4	PP, EP			2	
3445	NICOTINE SULPHATE, SOLID	6.1	T2	II	6.1	802	LQ18	E4	PP, EP			2	
3446	NITROTOLUENES, SOLID	6.1	T2	II	6.1	802	LQ18	E4	PP, EP			2	
3447	NITROXYLENES, SOLID	6.1	T2	II	6.1	802	LQ18	E4	PP, EP			2	

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(1)	3.1.2 (2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(8)	(9)	(10)	(11)	(12)	(13)
3448	TEAR GAS SUBSTANCE, SOLID, N.O.S.	6.1	T2	I	6.1	274 802	LQ0 E5		PP, EP			2	
3448	TEAR GAS SUBSTANCE, SOLID, N.O.S.	6.1	T2	II	6.1	274 802	LQ18 E4		PP, EP			2	
3449	BROMOBENZYL CYANIDES, SOLID	6.1	T2	I	6.1	138 802	LQ0 E5		PP, EP			2	
3450	DIPHENYLCHLOROARSINE, SOLID	6.1	T3	I	6.1	802	LQ0 E5		PP, EP			2	
3451	TOLUIDINES, SOLID	6.1	T2	II	6.1	279 802	LQ18 E4	T	PP, EP			2	
3452	XYLIDINES, SOLID	6.1	T2	II	6.1	802	LQ18 E4		PP, EP			2	
3453	PHOSPHORIC ACID, SOLID	8	C2	III	8		LQ24 E1		PP, EP			0	
3454	DINITROTOLUENES, SOLID	6.1	T2	II	6.1	802	LQ18 E4		PP, EP			2	
3455	CRESOLS, SOLID	6.1	TC2	II	6.1+8	802	LQ18 E4	T	PP, EP			2	
3456	NITROSYLSULPHURIC ACID, SOLID	8	C2	II	8		LQ23 E2	T3	PP, EP			0	
3457	CHLORONITROTOLUENES, SOLID	6.1	T2	III	6.1	802	LQ9 E1		PP, EP			0	
3458	NITROANISOL, SOLID	6.1	T2	III	6.1	279 802	LQ9 E1		PP, EP			0	
3459	NITROBROMOBENZENES, SOLID	6.1	T2	III	6.1	802	LQ9 E1		PP, EP			0	
3460	N-ETHYLBENZYL TOLUIDINES, SOLID	6.1	T2	III	6.1	802	LQ9 E1		PP, EP			0	
3462	TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.	6.1	T2	I	6.1	210 274 802	LQ0 E5		PP, EP			2	
3462	TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.	6.1	T2	II	6.1	210 274 802	LQ18 E4		PP, EP			2	
3462	TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.	6.1	T2	III	6.1	210 274 802	LQ9 E1		PP, EP			0	
3463	PROPIONIC ACID with not less than 90% acid by mass	8	CF1	II	8+3		LQ22 E2	T	PP, EP, EX, A			0	
3464	ORGANOPHOSPHORUS COMPOUND, TOXIC, SOLID, N.O.S.	6.1	T2	I	6.1	43 274 802	LQ0 E5		PP, EP			2	
3464	ORGANOPHOSPHORUS COMPOUND, TOXIC, SOLID, N.O.S.	6.1	T2	II	6.1	43 274 802	LQ18 E4		PP, EP			2	
3464	ORGANOPHOSPHORUS COMPOUND, TOXIC, SOLID, N.O.S.	6.1	T2	III	6.1	43 274 802	LQ9 E1		PP, EP			0	
3465	ORGANOARSENIC COMPOUND, SOLID, N.O.S.	6.1	T3	I	6.1	274 802	LQ0 E5		PP, EP			2	
3465	ORGANOARSENIC COMPOUND, SOLID, N.O.S.	6.1	T3	II	6.1	274 802	LQ18 E4		PP, EP			2	
3465	ORGANOARSENIC COMPOUND, SOLID, N.O.S.	6.1	T3	III	6.1	274 802	LQ9 E1		PP, EP			0	

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(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3466	METAL CARBONYLS, SOLID, N.O.S.	6.1	T3	I	6.1	274 562 802	LQ0 E5		PP, EP			2	
3466	METAL CARBONYLS, SOLID, N.O.S.	6.1	T3	II	6.1	274 562 802	LQ18 E4		PP, EP			2	
3466	METAL CARBONYLS, SOLID, N.O.S.	6.1	T3	III	6.1	274 562 802	LQ9 E1		PP, EP			0	
3467	ORGANOMETALLIC COMPOUND, TOXIC, SOLID, N.O.S.	6.1	T3	I	6.1	274 562 802	LQ0 E5		PP, EP			2	
3467	ORGANOMETALLIC COMPOUND, TOXIC, SOLID, N.O.S.	6.1	T3	II	6.1	274 562 802	LQ18 E4		PP, EP			2	
3467	ORGANOMETALLIC COMPOUND, TOXIC, SOLID, N.O.S.	6.1	T3	III	6.1	274 562 802	LQ9 E1		PP, EP			0	
3468	HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM or HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM CONTAINED IN EQUIPMENT or HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM PACKED WITH EQUIPMENT	2	2F		2.1	321	LQ0 E0	T	PP, EX, A	VE01		1	
3469	PAINT, FLAMMABLE, CORROSIVE (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL, FLAMMABLE, CORROSIVE (including paint thinning or reducing compound)	3	FC	I	3+8	163	LQ3 E0		PP, EX, A	VE01		1	
3469	PAINT, FLAMMABLE, CORROSIVE (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL, FLAMMABLE, CORROSIVE (including paint thinning or reducing compound)	3	FC	II	3+8	163	LQ4 E2		PP, EX, A	VE01		1	
3469	PAINT, FLAMMABLE, CORROSIVE (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL, FLAMMABLE, CORROSIVE (including paint thinning or reducing compound)	3	FC	III	3+8	163	LQ7 E1		PP, EX, A	VE01		0	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3470	PAINT, CORROSIVE, FLAMMABLE (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL CORROSIVE, FLAMMABLE (including paint thinning or reducing compound)	8	CF1	II	8 +3	163	LQ22	E2	PP, EP, EX, A	VE01		0	
3471	HYDROGENDIFLUORIDES SOLUTION, N.O.S.	8	CT1	II	8 +6.1		LQ22	E2	PP, EP			0	
3471	HYDROGENDIFLUORIDES SOLUTION, N.O.S.	8	CT1	III	8 +6.1		LQ7	E1	PP, EP			0	
3472	CROTONIC ACID, LIQUE	8	C3	III	8		LQ7	E1	PP, EP			0	
3473	FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT containing flammable liquids	3	F1		3	328	LQ13	E0					
3474	1-HYDROXYBENZOTRIAZOLE, ANHYDROUS, WETTED with not less than 20% water, by mass	4,1	D	I	4,1		LQ0	E0	PP			1	
3475	ETHANOL AND GASOLINE MIXTURE or ETHANOL AND MOTOR SPIRIT MIXTURE or ETHANOL AND PETROL MIXTURE, with more than 10% ethanol	3	F1	II	3	333	LQ4	E2	PP, EX, A	VE01		1	
3476	FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing water-reactive substances	4,3	W3		4,3	328 334	LQ10 LQ11	E0	PP, EX, A	VE01	HA08	0	
3477	FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing corrosive substances	8	C11		8	328 334	LQ12 LQ13	E0	PP, EX, A			0	
3478	FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing liquefied flammable gas	2	6F		2,1	328 338	LQ1	E0	PP, EX, A	VE01			
3479	FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing hydrogen in metal hydride	2	6F		2,1	328 339	LQ1	E0	PP, EX, A	VE01		1	

UN No. or ID No.	Name and description	Class	Classification Code	Packing group	Labels	Special provisions	Limited and excepted quantities	Carriage permitted	Equipment required	Ventilation	Provisions concerning loading, unloading and carriage	Number of blue cones/lights	Remarks
(1)	3.1.2 (2)	2.2 (3a)	2.2 (3b)	2.1.1.3 (4)	5.2.2 (5)	3.3 (6)	3.4.6 (7a)	3.2.1 (8)	8.1.5 (9)	7.1.6 (10)	7.1.6 (11)	7.1.5 (12)	3.2.1 (13)
3480	LITHIUM ION BATTERIES (including lithium ion polymer batteries)	9	M4	II	9	188 230 310 636	LQ0 E0		PP			0	
3481	LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)	9	M4	II	9	188 230 636	LQ0 E0		PP			0	
9000	AMMONIA, DEEPLY REFRIGERATED	2	3TC		2.3+8			T	PP			2	Admitted only for carriage in tank vessels
9001	SUBSTANCES WITH A FLASH-POINT ABOVE 60 °C which are carried heated within a limiting range of 15K below their flash-point	3	F3		none			T	PP			0	Dangerous only when carried in tank vessels
9002	SUBSTANCES WITH A SELF-IGNITION TEMPERATURE OF 200 °C AND BELOW, n.o.s.	3	F4		none			T	PP			0	Dangerous only when carried in tank vessels
9003	SUBSTANCES WITH A FLASH-POINT ABOVE 60 °C AND NOT MORE THAN 100 °C, which do not belong to another Class	9			none			T	PP			0	Dangerous only when carried in tank vessels
9004	DIPHENYLMETHANE-4, 4'-DISOCYANATE	9			none			T	PP			0	Dangerous only when carried in tank vessels
9005	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., MOLTEN	9			none			T	PP			0	Dangerous only when carried in tank vessels
9006	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	9			none			T	PP			0	Dangerous only when carried in tank vessels

3.2.2 Table B: List of dangerous goods in alphabetical order

The following Table B is an alphabetical list of the substances and articles which are listed in the UN numerical order in Table A of 3.2.1. It does not form an integral part of ADN. It has been prepared, with all necessary care by the Secretariat of the United Nations Economic Commission for Europe, in order to facilitate the consultation of Annexes A and B, but it cannot be relied upon as a substitute for the careful study and observance of the actual provisions of those annexed Regulations which, in case of conflict, are deemed to be authoritative.

NOTE 1: For the purpose of determining the alphabetical order the following information has been ignored, even when it forms part of the proper shipping name: numbers; Greek letters; the abbreviations "sec" and "tert"; and the letters "N" (nitrogen), "n" (normal), "o" (ortho) "m" (meta), "p" (para) and "N.O.S." (not otherwise specified).

NOTE 2: The name of a substance or article in block capital letters indicates a proper shipping name (see 3.1.2).

NOTE 3: The name of a substance or article in block capital letters followed by the word "see" indicates an alternative proper shipping name or part of a proper shipping name (except for PCBs) (see 3.1.2.1).

NOTE 4: An entry in lower case letters followed by the word "see" indicates that the entry is not a proper shipping name; it is a synonym.

NOTE 5: Where an entry is partly in block capital letters and partly in lower case letters, the latter part is considered not to be part of the proper shipping name (see 3.1.2.1).

NOTE 6: A proper shipping name may be used in the singular or plural, as appropriate, for the purposes of documentation and package marking (see 3.1.2.3).

NOTE 7: For the exact determination of a proper shipping name, see 3.1.2.

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
Accumulators, electric, see	2794	8		ACROLEIN DIMER, STABILIZED	2607	3	
	2795	8					
	2800	8		ACROLEIN, STABILIZED	1092	6.1	
	3028	8					
	3292	4.3		ACRYLAMIDE, SOLID	2074	6.1	
ACETAL	1088	3		ACRYLAMIDE, SOLUTION	3426	6.1	
ACETALDEHYDE	1089	3		ACRYLIC ACID, STABILIZED	2218	8	
				ACRYLONITRILE, STABILIZED	1093	3	
ACETALDEHYDE AMMONIA	1841	9		Actinolite, see	2590	9	
ACETALDEHYDE OXIME	2332	3		Activated carbon, see	1362	4.2	
ACETIC ACID, GLACIAL	2789	8		Activated charcoal, see	1362	4.2	
ACETIC ACID SOLUTION, more than 10% but not more than 80% acid, by mass	2790	8		ADHESIVES containing flammable liquid	1133	3	
ACETIC ACID SOLUTION, more than 80% acid, by mass	2789	8		ADIPONITRILE	2205	6.1	
ACETIC ANHYDRIDE	1715	8		Aeroplane flares, see	0093	1	
					0403	1	
					0404	1	
					0420	1	
					0421	1	
ACETONE	1090	3		AEROSOLS	1950	2	
ACETONE CYANOHYDRIN, STABILIZED	1541	6.1		AGENT, BLASTING, TYPE B	0331	1	
ACETONE OILS	1091	3		AGENT, BLASTING, TYPE E	0332	1	
ACETONITRILE	1648	3		AIR BAG INFLATORS	0503	1	
ACETYL BROMIDE	1716	8			3268	9	
ACETYL CHLORIDE	1717	3		AIR BAG MODULES	0503	1	
ACETYLENE, DISSOLVED	1001	2			3268	9	
ACETYLENE, SOLVENT FREE	3374	2		AIR, COMPRESSED	1002	2	
Acetylene tetrabromide, see	2504	6.1		Aircraft evacuation slides, see	2990	9	
Acetylene tetrachloride, see	1702	6.1		AIRCRAFT HYDRAULIC POWER UNIT FUEL TANK (containing a mixture of anhydrous hydrazine and methylhydrazine) (M86 fuel)	3165	3	
ACETYL IODIDE	1898	8		Aircraft survival kits, see	2990	9	
ACETYL METHYL CARBINOL	2621	3		AIR, REFRIGERATED LIQUID	1003	2	
Acid butyl phosphate, see	1718	8		ALCOHOLATES SOLUTION, N.O.S., in alcohol	3274	3	
Acid mixture, hydrofluoric and sulphuric, see	1786	8		Alcohol, denaturated, see	1986	3	
Acid mixture, nitrating acid, see	1796	8			1987	3	
Acid mixture, spent, nitrating acid, see	1826	8		Alcohol, industrial, see	1986	3	
Acraldehyde, inhibited, see	1092	6.1			1987	3	
ACRIDINE	2713	6.1		ALCOHOLS, N.O.S.	1987	3	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	1986	3		ALKYLPHENOLS, LIQUID, N.O.S. (including C ₂ -C ₁₂ homologues)	3145	8	
ALCOHOLIC BEVERAGES, with more than 24% but not more than 70% alcohol by volume	3065	3		ALKYLPHENOLS, SOLID, N.O.S. (including C ₂ -C ₁₂ homologues)	2430	8	
ALCOHOLIC BEVERAGES, with more than 70% alcohol by volume	3065	3		ALKYLSULPHONIC ACIDS, LIQUID with more than 5% free sulphuric acid	2584	8	
Aldehyde, see	1989	3		ALKYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	2586	8	
ALDEHYDES, N.O.S.	1989	3					
ALDEHYDES, FLAMMABLE, TOXIC, N.O.S.	1988	3		ALKYLSULPHONIC ACIDS, SOLID with more than 5% free sulphuric acid	2583	8	
ALDOL	2839	6.1		ALKYLSULPHONIC ACIDS, SOLID with not more than 5% free sulphuric acid	2585	8	
ALKALI METAL ALCOHOLATES, SELF-HEATING, CORROSIVE, N.O.S.	3206	4.2		ALKYLSULPHURIC ACIDS	2571	8	
ALKALI METAL ALLOY, LIQUID, N.O.S.	1421	4.3		Allene, see	2200	2	
ALKALI METAL AMALGAM, LIQUID	1389	4.3		ALLYL ACETATE	2333	3	
ALKALI METAL AMALGAM, SOLID	3401	4.3		ALLYL ALCOHOL	1098	6.1	
ALKALI METAL AMIDES	1390	4.3		ALLYLAMINE	2334	6.1	
ALKALI METAL DISPERSION	1391	4.3		ALLYL BROMIDE	1099	3	
Alkaline corrosive battery fluid, see	2797	8		ALLYL CHLORIDE	1100	3	
ALKALINE EARTH METAL ALCOHOLATES, N.O.S.	3205	4.2		Allyl chlorocarbonate, see	1722	6.1	
ALKALINE EARTH METAL ALLOY, N.O.S.	1393	4.3		ALLYL CHLOROFORMATE	1722	6.1	
ALKALINE EARTH METAL AMALGAM, LIQUID	1392	4.3		ALLYL ETHYL ETHER	2335	3	
ALKALINE EARTH METAL AMALGAM, SOLID	3402	4.3		ALLYL FORMATE	2336	3	
ALKALINE EARTH METAL DISPERSION	1391	4.3		ALLYL GLYCIDYL ETHER	2219	3	
ALKALOIDS, LIQUID, N.O.S.	3140	6.1		ALLYL IODIDE	1723	3	
ALKALOIDS, SOLID, N.O.S.	1544	6.1		ALLYL ISOTHIOCYANATE, STABILIZED	1545	6.1	
ALKALOID SALTS, LIQUID, N.O.S.	3140	6.1		ALLYLTRICHLOROSILANE, STABILIZED	1724	8	
ALKALOID SALTS, SOLID, N.O.S.	1544	6.1		Aluminium alkyls, see	3394	4.2	
Alkyl aluminium halides, see	3394	4.2		Aluminium alkyl halides, liquid, see	3394	4.2	
				Aluminium alkyl halides, solid, see	3393	4.2	
				Aluminium alkyl hydrides, see	3394	4.2	
				ALUMINIUM BOROHYDRIDE	2870	4.2	
				ALUMINIUM BOROHYDRIDE IN DEVICES	2870	4.2	
				ALUMINIUM BROMIDE, ANHYDROUS	1725	8	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
ALUMINIUM BROMIDE SOLUTION	2580	8		2-AMINO-5-DIETHYLAMINOPENTANE	2946	6.1	
ALUMINIUM CARBIDE	1394	4.3		2-AMINO-4,6-DINITROPHENOL, WETTED with not less than 20% water, by mass	3317	4.1	
ALUMINIUM CHLORIDE, ANHYDROUS	1726	8		2-(2-AMINOETHOXY) ETHANOL	3055	8	
ALUMINIUM CHLORIDE SOLUTION	2581	8		N-AMINOETHYLPIPERAZINE	2815	8	
Aluminium dross, see	3170	4.3		1-Amino-2-nitrobenzene, see	1661	6.1	
ALUMINIUM FERROSILICON POWDER	1395	4.3		1-Amino-3-nitrobenzene, see	1661	6.1	
ALUMINIUM HYDRIDE	2463	4.3		1-Amino-4-nitrobenzene, see	1661	6.1	
ALUMINIUM NITRATE	1438	5.1		AMINOPHENOLS (o-, m-, p-)	2512	6.1	
ALUMINIUM PHOSPHIDE	1397	4.3		AMINOPYRIDINES (o-, m-, p-)	2671	6.1	
ALUMINIUM PHOSPHIDE PESTICIDE	3048	6.1		AMMONIA, ANHYDROUS	1005	2	
ALUMINIUM POWDER, COATED	1309	4.1		AMMONIA, DEEPLY REFRIGERATED	9000	2	Admitted only for carriage in tank vessel
ALUMINIUM POWDER, UNCOATED	1396	4.3		AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15 °C in water, with more than 10% but not more than 35% ammonia	2672	8	
ALUMINIUM REMELTING BY-PRODUCTS	3170	4.3		AMMONIA SOLUTION, relative density less than 0.880 at 15 °C in water, with more than 35% but not more than 50% ammonia	2073	2	
ALUMINIUM RESINATE	2715	4.1		AMMONIA SOLUTION, relative density less than 0.880 at 15 °C in water, with more than 50% ammonia	3318	2	
ALUMINIUM SILICON POWDER, UNCOATED	1398	4.3		AMMONIUM ARSENATE	1546	6.1	
ALUMINIUM SMELTING BY-PRODUCTS	3170	4.3		Ammonium bichromate, see	1439	5.1	
Amatols, see	0082	1		Ammonium bifluoride solid, see	1727	8	
AMINES, FLAMMABLE, CORROSIVE, N.O.S.	2733	3		Ammonium bifluoride solution, see	2817	8	
AMINES, LIQUID, CORROSIVE, N.O.S.	2735	8		Ammonium bisulphate, see	2506	8	
AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.	2734	8		Ammonium bisulphite solution, see	2693	8	
AMINES, SOLID, CORROSIVE, N.O.S.	3259	8		AMMONIUM DICHROMATE	1439	5.1	
Aminobenzene, see	1547	6.1		AMMONIUM DINITRO-o-CRESOLATE, SOLID	1843	6.1	
2-Aminobenzotrifluoruride, see	2942	6.1		AMMONIUM DINITRO-o-CRESOLATE, SOLUTION	3424	6.1	
3-Aminobenzotrifluoruride, see	2948	6.1		AMMONIUM FLUORIDE	2505	6.1	
Aminobutane, see	1125	3					
2-AMINO-4-CHLOROPHENOL	2673	6.1					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
AMMONIUM FLUROSILICATE	2854	6.1		AMMONIUM NITRATE GEL, intermediate for blasting explosives, solid	3375	5.1	
Ammonium hexafluorosilicate, see	2854	6.1					
AMMONIUM HYDROGENDIFLUORIDE, SOLID	1727	8		AMMONIUM NITRATE, LIQUID hot concentrated solution, in a concentration of more than 80% but not more than 93%	2426	5.1	
AMMONIUM HYDROGENDIFLUORIDE SOLUTION	2817	8		AMMONIUM NITRATE SUSPENSION, intermediate for blasting explosives, liquid	3375	5.1	
AMMONIUM HYDROGEN SULPHATE	2506	8		AMMONIUM NITRATE SUSPENSION, intermediate for blasting explosives, solid	3375	5.1	
Ammonium hydrosulphide solution (treat as ammonium sulphide solution), see	2683	8		AMMONIUM PERCHLORATE	0402 1442	1 5.1	
AMMONIUM METAVANADATE	2859	6.1		Ammonium permanganate, see	1482	5.1	
AMMONIUM NITRATE with more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	0222	1		AMMONIUM PERSULPHATE	1444	5.1	
AMMONIUM NITRATE with not more than 0.2% total combustible material, including any organic substance calculated as carbon, to the exclusion of any other added substance	1942	5.1		AMMONIUM PICRATE dry or wetted with less than 10% water, by mass	0004	1	
AMMONIUM NITRATE EMULSION, intermediate for blasting explosives, liquid	3375	5.1		AMMONIUM PICRATE, WETTED with not less than 10% water, by mass	1310	4.1	
AMMONIUM NITRATE EMULSION, intermediate for blasting explosives, solid	3375	5.1		AMMONIUM POLYSULPHIDE SOLUTION	2818	8	
Ammonium nitrate explosive, see	0082 0331	1 1		AMMONIUM POLYVANADATE	2861	6.1	
AMMONIUM NITRATE BASED FERTILIZER	2067	5.1		Ammonium silicofluoride, see	2854	6.1	
AMMONIUM NITRATE BASED FERTILIZER, uniform mixtures of the nitrogen/phosphate, nitrogen/potash or nitrogen/phosphate/potash type, containing not more than 70% ammonium nitrate and not more than 0.4% total combustible/organic material calculated as carbon or with not more than 45% ammonium nitrate and unrestricted combustible material	2071	9		AMMONIUM SULPHIDE SOLUTION	2683	8	
				Ammunition, blank, see	0014 0326 0327 0338 0413	1 1 1 1 1	
				Ammunition, fixed	0005	1	
				Ammunition, semi-fixed	0006	1	
				Ammunition, separate loading, see	0007 0321 0348 0412	1 1 1 1	
				AMMUNITION, ILLUMINATING with or without burster, expelling charge or propelling charge	0171 0254 0297	1 1 1	
AMMONIUM NITRATE GEL, intermediate for blasting explosives, liquid	3375	5.1		AMMUNITION, INCENDIARY, liquid or gel, with burster, expelling charge or propelling charge	0247	1	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
AMMUNITION, INCENDIARY with or without burster, expelling charge or propelling charge	0009 0010 0300	1 1 1		AMMUNITION, TOXIC with burster, expelling charge or propelling charge	0020	1	Carriage prohibited
Ammunition, incendiary (water-activated contrivances) with burster, expelling charge or propelling charge, see	0248 0249	1 1		AMMUNITION, TOXIC with burster, expelling charge or propelling charge	0021	1	Carriage prohibited
AMMUNITION, INCENDIARY, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	0243 0244	1 1		Ammunition, toxic (water-activated contrivances) with burster, expelling charge or propelling charge, see	0248 0249	1 1	
Ammunition, industrial, see	0275 0276 0277 0278 0323 0381	1 1 1 1 1 1		AMMUNITION, TOXIC, NON-EXPLOSIVE without burster or expelling charge, non-fuzed	2016	6.1	
Ammunition, lachrymatory, see	0018 0019 0301 2017	1 1 1 1		Amosite, see	2212	9	
AMMUNITION, PRACTICE	0362 0488	1 1		AMYL ACETATES	1104	3	
AMMUNITION, PROOF	0363	1		AMYL ACID PHOSPHATE	2819	8	
AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge	0015 0016 0303	1 1 1		Amyl aldehyde, see	2058	3	
Ammunition, smoke (water-activated contrivances), white phosphorus with burster, expelling charge or propelling charge, see	0248	1		AMYLAMINE	1106	3	
Ammunition, smoke (water-activated contrivances), without white phosphorus or phosphides with burster, expelling charge or propelling charge, see	0249	1		n-Amylamine, see	1106	3	
AMMUNITION, SMOKE, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	0245 0246	1 1		AMYL BUTYRATES	2620	3	
Ammunition, sporting, see	0012 0328 0339 0417	1 1 1 1		AMYL CHLORIDE	1107	3	
AMMUNITION, TEAR-PRODUCING, NON-EXPLOSIVE without burster or expelling charge, non-fuzed	2017	6.1		n-AMYLENE, see	1108	3	
AMMUNITION, TEAR-PRODUCING with burster, expelling charge or propelling charge	0018 0019 0301	1 1 1		AMYL FORMATES	1109	3	
				AMYL MERCAPTAN	1111	3	
				n-AMYL METHYL KETONE	1110	3	
				AMYL NITRATE	1112	3	
				AMYL NITRITE	1113	3	
				AMYLTRICHLOROSILANE	1728	8	
				Anaesthetic ether, see	1155	3	
				ANILINE	1547	6.1	
				Aniline chloride, see	1548	6.1	
				ANILINE HYDROCHLORIDE	1548	6.1	
				Aniline oil, see	1547	6.1	
				Aniline salt, see	1548	6.1	
				ANISIDINES	2431	6.1	
				ANISOLE	2222	3	
				ANISOYL CHLORIDE	1729	8	
				Anthophyllite, see	2590	9	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
Antimonous chloride, see	1733	8		ARSENIC BROMIDE	1555	6.1	
ANTIMONY COMPOUND, INORGANIC, LIQUID, N.O.S.	3141	6.1		Arsenic (III) bromide, see	1555	6.1	
ANTIMONY COMPOUND, INORGANIC, SOLID, N.O.S.	1549	6.1		Arsenic chloride, see	1560	6.1	
Antimony hydride, see	2676	2		ARSENIC COMPOUND, LIQUID, N.O.S., inorganic, including: Arsenates, n.o.s.; Arsenites, n.o.s.; and Arsenic sulphides, n.o.s.	1556	6.1	
ANTIMONY LACTATE	1550	6.1		ARSENIC COMPOUND, SOLID, N.O.S., inorganic, including: Arsenates, n.o.s.; Arsenites, n.o.s.; and Arsenic sulphides, n.o.s.	1557	6.1	
Antimony (III) lactate, see	1550	6.1					
ANTIMONY PENTACHLORIDE, LIQUID	1730	8		Arsenic (III) oxide, see	1561	6.1	
ANTIMONY PENTACHLORIDE SOLUTION	1731	8		Arsenic (V) oxide, see	1559	6.1	
ANTIMONY PENTAFLUORIDE	1732	8		ARSENIC PENTOXIDE	1559	6.1	
Antimony perchloride, liquid, see	1730	8		Arsenic sulphides, see	1556 1557	6.1 6.1	
ANTIMONY POTASSIUM TARTRATE	1551	6.1		ARSENIC TRICHLORIDE	1560	6.1	
ANTIMONY POWDER	2871	6.1		ARSENIC TRIOXIDE	1561	6.1	
ANTIMONY TRICHLORIDE	1733	8		Arsenious chloride, see	1560	6.1	
A.n.t.u., see	1651	6.1		Arsenites, n.o.s., see	1556 1557	6.1 6.1	
ARGON, COMPRESSED	1006	2		Arsenous chloride, see	1560	6.1	
ARGON, REFRIGERATED LIQUID	1951	2		ARSINE	2188	2	
Arsenates, n.o.s., see	1556 1557	6.1 6.1		ARTICLES, EEI, see	0486	1	
ARSENIC	1558	6.1		ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE	0486	1	
ARSENIC ACID, LIQUID	1553	6.1		ARTICLES, EXPLOSIVE, N.O.S.	0349 0350 0351 0352 0353 0354 0355 0356	1 1 1 1 1 1 1 1	
ARSENIC ACID, SOLID	1554	6.1			0462 0463 0464 0465 0466 0467 0468 0469 0470 0471 0472	1 1 1 1 1 1 1 1 1 1 1	
ARSENICAL DUST	1562	6.1					
Arsenical flue dust, see	1562	6.1					
ARSENICAL PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2760	3					
ARSENICAL PESTICIDE, LIQUID, TOXIC	2994	6.1					
ARSENICAL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	2993	6.1					
ARSENICAL PESTICIDE, SOLID, TOXIC	2759	6.1					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
ARTICLES, PRESSURIZED, HYDRAULIC (containing non-flammable gas)	3164	2		BARIUM	1400	4.3	
				BARIUM ALLOYS, PYROPHORIC	1854	4.2	
ARTICLES, PRESSURIZED, PNEUMATIC (containing non-flammable gas)	3164	2		BARIUM AZIDE, dry or wetted with less than 50% water, by mass	0224	1	
ARTICLES, PYROPHORIC	0380	1		BARIUM AZIDE, WETTED with not less than 50% water, by mass	1571	4.1	
ARTICLES, PYROTECHNIC for technical purposes	0428	1		Barium binoxide, see	1449	5.1	
	0429	1					
	0430	1		BARIUM BROMATE	2719	5.1	
	0431	1					
	0432	1		BARIUM CHLORATE, SOLID	1445	5.1	
ARYLSULPHONIC ACIDS, LIQUID with more than 5% free sulphuric acid	2584	8		BARIUM CHLORATE, SOLUTION	3405	5.1	
				BARIUM COMPOUND, N.O.S.	1564	6.1	
ARYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	2586	8		BARIUM CYANIDE	1565	6.1	
				Barium dioxide, see	1449	5.1	
ARYLSULPHONIC ACIDS, SOLID with more than 5% free sulphuric acid	2583	8		BARIUM HYPOCHLORITE with more than 22% available chlorine	2741	5.1	
				BARIUM NITRATE	1446	5.1	
ARYLSULPHONIC ACIDS, SOLID with not more than 5% free sulphuric acid	2585	8		BARIUM OXIDE	1884	6.1	
Asbestos, blue or brown, see	2212	9		BARIUM PERCHLORATE, SOLID	1447	5.1	
Asbestos, white, see	2590	9		BARIUM PERCHLORATE, SOLUTION	3406	5.1	
Asphalt, with a flash-point not greater than 60 °C, see	1999	3		BARIUM PERMANGANATE	1448	5.1	
Asphalt, with a flash-point above 60 °C, at or above its flash-point, see	3256	3		BARIUM PEROXIDE	1449	5.1	
Asphalt, at or above 100 °C and below its flash-point, see	3257	9		Barium selenate, see	2630	6.1	
Aviation regulated liquid, n.o.s.	3334	9	Not subject to ADN	Barium selenite, see	2630	6.1	
				Barium superoxide, see	1449	5.1	
Aviation regulated solid, n.o.s.	3335	9	Not subject to ADN	BATTERIES, CONTAINING SODIUM	3292	4.3	
				BATTERIES, DRY, CONTAINING POTASSIUM HYDROXIDE SOLID, electric storage	3028	8	
AZODICARBONAMIDE	3242	4.1					
Bag charges, see	0242	1		BATTERIES, WET, FILLED WITH ACID, electric storage	2794	8	
	0279	1					
	0414	1		BATTERIES, WET, FILLED WITH ALKALI, electric storage	2795	8	
Ballistite, see	0160	1					
	0161	1		BATTERIES, WET, NON-SPILLABLE, electric storage	2800	8	
Bangalore torpedoes, see	0136	1					
	0137	1		BATTERY FLUID, ACID	2796	8	
	0138	1					
	0294	1		BATTERY FLUID, ALKALI	2797	8	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
Battery-powered vehicle or Battery-powered equipment	3171	9	Not subject to ADN	BIOLOGICAL SUBSTANCE, CATEGORY B (animal material only)	3373	6.2	
BENZALDEHYDE	1990	9		(BIO) MEDICAL WASTE, N.O.S.	3291	6.2	
BENZENE	1114	3		BIPYRIDILIUM PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2782	3	
BENZENESULPHONYL CHLORIDE	2225	8		BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC	3016	6.1	
Benzenethiol, see	2337	6.1		BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3015	6.1	
BENZIDINE	1885	6.1		BIPYRIDILIUM PESTICIDE, SOLID, TOXIC	2781	6.1	
Benzol, see	1114	3		BISULPHATES, AQUEOUS SOLUTION	2837	8	
Benzolene, see	1268	3		BISULPHITES, AQUEOUS SOLUTION, N.O.S.	2693	8	
BENZONITRILE	2224	6.1		Bitumen, with a flash-point not greater than 60 °C, see	1999	3	
BENZOQUINONE	2587	6.1		Bitumen, with a flash-point not greater than 60 °C, see	1999	3	
Benzosulphochloride, see	2225	8		Bitumen, with a flash-point above 60 °C, at or above its flash-point, see	3256	3	
BENZOTRICHLORIDE	2226	8		Bitumen, at or above 100 °C and below its flash-point, see	3257	9	
BENZOTRIFLUORIDE	2338	3		BLACK POWDER, COMPRESSED	0028	1	
BENZOYL CHLORIDE	1736	8		BLACK POWDER, granular or as a meal	0027	1	
BENZYL BROMIDE	1737	6.1		BLACK POWDER, IN PELLETS	0028	1	
BENZYL CHLORIDE	1738	6.1		Blasting cap assemblies, see	0360	1	
Benzyl chlorocarbonate, see	1739	8			0361	1	
BENZYL CHLOROFORMATE	1739	8		Blasting caps, electric, see	0030	1	
Benzyl cyanide, see	2470	6.1			0255	1	
BENZYLDIMETHYLAMINE	2619	8			0456	1	
BENZYLIDENE CHLORIDE	1886	6.1		Bleaching powder, see	2208	5.1	
BENZYL IODIDE	2653	6.1		BLUE ASBESTOS (crocidolite)	2212	9	
BERYLLIUM COMPOUND, N.O.S.	1566	6.1		BOMBS with bursting charge	0033	1	
BERYLLIUM NITRATE	2464	5.1			0034	1	
BERYLLIUM POWDER	1567	6.1			0035	1	
Bhusa	1327	4.1	Not subject to ADN		0291	1	
BICYCLO[2.2.1]HEPTA-2,5-DIENE, STABILIZED	2251	3		Bombs, illuminating, see	0254	1	
Bifluorides, n.o.s., see	1740	8					
BIOLOGICAL SUBSTANCE, CATEGORY B	3373	6.2					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
BOMBS, PHOTO-FLASH	0037	1		BROMINE SOLUTION	1744	8	
	0038	1					
	0039	1		BROMINE TRIFLUORIDE	1746	5.1	
	0299	1					
BOMBS, SMOKE, NON-EXPLOSIVE with corrosive liquid, without initiating device	2028	8		BROMOACETIC ACID, SOLID	3425	8	
				BROMOACETIC ACID, SOLUTION	1938	8	
Bombs, target identification, see	0171	1		BROMOACETONE	1569	6.1	
	0254	1					
	0297	1		omega-Bromoacetone, see	2645	6.4	
BOMBS WITH FLAMMABLE LIQUID with bursting charge	0399	1		BROMOACETYL BROMIDE	2513	8	
	0400	1					
BOOSTERS WITH DETONATOR	0225	1		BROMOBENZENE	2514	3	
	0268	1					
BOOSTERS without detonator	0042	1		BROMOBENZYL CYANIDES, LIQUID	1694	6.1	
	0283	1					
Borate and chlorate mixture, see	1458	5.1		BROMOBENZYL CYANIDES, SOLID	3449	6.1	
BORNEOL	1312	4.1		1-BROMOBUTANE	1126	3	
BORON TRIBROMIDE	2692	8		2-BROMOBUTANE	2339	3	
BORON TRICHLORIDE	1741	2		BROMOCHLORO-METHANE	1887	6.1	
BORON TRIFLUORIDE ACETIC ACID COMPLEX, LIQUID	1742	8		1-BROMO-3-CHLOROPROPANE	2688	6.1	
				1-Bromo-2,3-epoxypropane, see	2558	6.1	
BORON TRIFLUORIDE ACETIC ACID COMPLEX, SOLID	3419	8		Bromoethane, see	1891	6.1	
BORON TRIFLUORIDE	1008	2		2-BROMOETHYL ETHYL ETHER	2340	3	
BORON TRIFLUORIDE DIETHYL ETHERATE	2604	8		BROMOFORM	2515	6.1	
				Bromomethane, see	1062	2	
BORON TRIFLUORIDE DIHYDRATE	2851	8		1-BROMO-3-METHYLBUTANE	2341	3	
BORON TRIFLUORIDE DIMETHYL ETHERATE	2965	4.3		BROMOMETHYLPROPANES	2342	3	
				2-BROMO-2-NITROPROPANE-1,3-DIOL	3241	4.1	
BORON TRIFLUORIDE PROPIONIC ACID COMPLEX, LIQUID	1743	8		2-BROMOPENTANE	2343	3	
				BROMOPROPANES	2344	3	
BORON TRIFLUORIDE PROPIONIC ACID COMPLEX, SOLID	3420	8		3-BROMOPROPYNE	2345	3	
BROMATES, INORGANIC, N.O.S.	1450	5.1		BROMOTRIFLUOROETHYLENE	2419	2	
BROMATES, INORGANIC, AQUEOUS SOLUTION, N.O.S	3213	5.1		BROMOTRIFLUOROMETHANE	1009	2	
BROMINE	1744	8		BROWN ASBESTOS (amosite, mysorite)	2212	9	
BROMINE CHLORIDE	2901	2		BRUCINE	1570	6.1	
BROMINE PENTAFLUORIDE	1745	5.1		BURSTERS, explosive	0043	1	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED, having a vapour pressure at 70 °C not exceeding 1.1 MPa (11 bar) and a density at 50 °C not lower than 0.525 kg/l	1010	2		n-BUTYL CHLOROFORMATE	2743	6.1	
BUTADIENES, STABILIZED, (1,2-butadiene)	1010	2		tert-BUTYLCYCLOHEXYL CHLOROFORMATE	2747	6.1	
BUTADIENES, STABILIZED, (1,3-butadiene)	1010	2		BUTYLENES MIXTURE or 1-BUTYLENE or CIS-2-BUTYLENE or TRANS-2-BUTYLENE	1012	2	
BUTANE	1011	2		1,2-BUTYLENE OXIDE, STABILIZED	3022	3	
BUTANEDIONE	2346	3		Butyl ethers, see	1149	3	
Butane-1-thiol, see	2347	3		Butyl ethyl ether, see	1179	3	
BUTANOLS	1120	3		n-BUTYL FORMATE	1128	3	
1-Butanol, see	1120	3		tert-BUTYL HYPOCHLORITE	3255	4.2	Carriage prohibited
Butan-2-ol, see	1120	3		N,n-BUTYLIMIDAZOLE	2690	6.1	
Butanol, secondary, see	1120	3		N,n-Butyliminazole, see	2690	6.1	
Butanol, tertiary, see	1120	3		n-BUTYL ISOCYANATE	2485	6.1	
Butanone, see	1193	3		tert-BUTYL ISOCYANATE	2484	6.1	
2-Butenal, see	1143	6.1		Butyl lithium, see	3394	4.2	
Butene, see	1012	2		BUTYL MERCAPTAN	2347	3	
Bute-1-ene-3-one, see	1251	3		n-BUTYL METHACRYLATE, STABILIZED	2227	3	
1,2-Buteneoxide, see	3022	3		BUTYL METHYL ETHER	2350	3	
2-Buten-1-ol, see	2614	3		BUTYL NITRITES	2351	3	
BUTYL ACETATES	1123	3		Butylphenols, liquid, see	3145	8	
Butyl acetate, secondary, see	1123	3		Butylphenols, solid, see	2430	8	
BUTYL ACID PHOSPHATE	1718	8		BUTYL PROPIONATES	1914	3	
BUTYL ACRYLATES, STABILIZED	2348	3		p-tert-Butyltoluene, see	2667	6.1	
n-Butyl alcohol, see	1120	3		BUTYLTOLUENES	2667	6.1	
Butyl alcohols, see	1120	3		BUTYLTRICHLOROSILANE	1747	8	
n-BUTYLAMINE	1125	3		5-tert-BUTYL-2,4,6-TRINITRO-m-XYLENE	2956	4.1	
N-BUTYLANILINE	2738	6.1		BUTYL VINYL ETHER, STABILIZED	2352	3	
sec-Butyl benzene, see	2709	3		But-1-yne, see	2452	2	
BUTYLBENZENES	2709	3		1,4-BUTYNEDIOL	2716	6.1	
n-Butyl bromide, see	1126	3		2-Butyne-1,4-diol, see	2716	6.1	
n-Butyl chloride, see	1127	3					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
BUTYRALDEHYDE	1129	3		CALCIUM HYDRIDE	1404	4.3	
n-Butyraldehyde, see	1129	3		CALCIUM HYDROSULPHITE, see	1923	4.2	
BUTYRALDOXIME	2840	3		CALCIUM HYPOCHLORITE, DRY	1748	5.1	
BUTYRIC ACID	2820	8		CALCIUM HYPOCHLORITE, HYDRATED with not less than 5.5% but not more than 16% water	2880	5.1	
BUTYRIC ANHYDRIDE	2739	8					
Butyrene, see	2710	3		CALCIUM HYPOCHLORITE, HYDRATED MIXTURE with not less than 5.5% but not more than 16% water	2880	5.1	
BUTYRONITRILE	2411	3					
Butyroyl chloride, see	2353	3		CALCIUM HYPOCHLORITE MIXTURE, DRY with more than 10% but not more than 39% available chlorine	2208	5.1	
BUTYRYL CHLORIDE	2353	3					
Cable cutters, explosive, see	0070	1					
CACODYLIC ACID	1572	6.1		CALCIUM HYPOCHLORITE MIXTURE, DRY with more than 39% available chlorine (8.8% available oxygen)	1748	5.1	
CADMIUM COMPOUND	2570	6.1					
CAESIUM	1407	4.3		CALCIUM MANGANESE SILICON	2844	4.3	
CAESIUM HYDROXIDE	2682	8					
CAESIUM HYDROXIDE SOLUTION	2681	8		CALCIUM NITRATE	1454	5.1	
CAESIUM NITRATE	1451	5.1		Calcium oxide	1910	8	Not subject to ADN
Caffeine, see	1544	6.1					
Cajeputene, see	2052	3		CALCIUM PERCHLORATE	1455	5.1	
CALCIUM	1401	4.3		CALCIUM PERMANGANATE	1456	5.1	
CALCIUM ALLOYS, PYROPHORIC	1855	4.2		CALCIUM PEROXIDE	1457	5.1	
				CALCIUM PHOSPHIDE	1360	4.3	
CALCIUM ARSENATE	1573	6.1		CALCIUM, PYROPHORIC	1855	4.2	
CALCIUM ARSENATE AND CALCIUM ARSENITE MIXTURE, SOLID	1574	6.1		CALCIUM RESINATE	1313	4.1	
				CALCIUM RESINATE, FUSED	1314	4.1	
Calcium bisulphite solution, see	2693	8		Calcium selenate, see	2630	6.1	
CALCIUM CARBIDE	1402	4.3		CALCIUM SILICIDE	1405	4.3	
CALCIUM CHLORATE	1452	5.1		Calcium silicon, see	1405	4.3	
CALCIUM CHLORATE, AQUEOUS SOLUTION	2429	5.1		Calcium superoxide, see	1457	5.1	
				Camphanone, see	2717	4.1	
CALCIUM CHLORITE	1453	5.1		CAMPBOR OIL	1130	3	
CALCIUM CYANAMIDE with more than 0.1% calcium carbide	1403	4.3		CAMPBOR, synthetic	2717	4.1	
CALCIUM CYANIDE	1575	6.1		CAPROIC ACID	2829	8	
CALCIUM DITHIONITE	1923	4.2					

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CARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2758	3		Cartridges, actuating, for fire	0275	1	
				extinguisher or apparatus valve, see	0276	1	
					0323	1	
					0381	1	
CARBAMATE PESTICIDE, LIQUID, TOXIC	2992	6.1		Cartridges, explosive, see	0048	1	
CARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	2991	6.1		CARTRIDGES, FLASH	0049	1	
					0050	1	
CARBAMATE PESTICIDE, SOLID, TOXIC	2757	6.1		CARTRIDGES FOR WEAPONS with bursting charge	0005	1	
					0006	1	
					0007	1	
					0321	1	
Carbolic acid, see	1671	6.1			0348	1	
	2312	6.1			0412	1	
	2821	6.1					
CARBON, animal or vegetable origin	1361	4.2		CARTRIDGES FOR WEAPONS, BLANK	0014	1	
					0326	1	
					0327	1	
					0338	1	
CARBON, ACTIVATED	1362	4.2			0413	1	
Carbon bisulphide, see	1131	3		CARTRIDGES FOR WEAPONS, INERT PROJECTILE	0012	1	
Carbon black (animal or vegetable origin), see	1361	4.2			0328	1	
					0339	1	
					0417	1	
CARBON DIOXIDE	1013	2		Cartridges, illuminating, see	0171	1	
Carbon dioxide and ethylene oxide mixture, see	1041	2			0254	1	
	1952	2			0297	1	
	3300	2		CARTRIDGES, OIL WELL	0277	1	
					0278	1	
CARBON DIOXIDE, REFRIGERATED LIQUID	2187	2		CARTRIDGES, POWER DEVICE	0275	1	
Carbon dioxide, solid	1845	9	Not subject to ADN		0276	1	
					0323	1	
					0381	1	
CARBON DISULPHIDE	1131	3		CARTRIDGES, SIGNAL	0054	1	
					0312	1	
					0405	1	
Carbonic anhydride, see	1013	2					
	1845	9		CARTRIDGES, SMALL ARMS	0012	1	
	2187	2			0339	1	
					0417	1	
CARBON MONOXIDE, COMPRESSED	1016	2		CARTRIDGES, SMALL ARMS, BLANK	0014	1	
Carbon oxysulphide, see	2204	2.3			0327	1	
					0338	1	
Carbon sulphide, see	1131	3		Cartridges, starter, jet engine, see	0275	1	
					0276	1	
CARBON TETRABROMIDE	2516	6.1			0323	1	
					0381	1	
CARBON TETRACHLORIDE	1846	6.1					
Carbonyl chloride, see	1076	2		CASES, CARTRIDGE, EMPTY, WITH PRIMER	0055	1	
					0379	1	
CARBONYL FLUORIDE	2417	2		CASES, COMBUSTIBLE, EMPTY, WITHOUT PRIMER	0446	1	
					0447	1	
CARBONYL SULPHIDE	2204	2					
Cartridge cases, empty, primed, see	0055	1		Casinghead gasoline, see	1203	3	
	0379	1					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
CASTOR BEANS	2969	9		CHARGES, SHAPED, FLEXIBLE, LINEAR	0237 0288	1 1	
CASTOR FLAKE	2969	9					
CASTOR MEAL	2969	9		CHARGES, SHAPED, without detonator	0059 0439 0440 0441	1 1 1 1	
CASTOR POMACE	2969	9					
CAUSTIC ALKALI LIQUID, N.O.S.	1719	8		CHARGES, SUPPLEMENTARY, EXPLOSIVE	0060	1	
Caustic potash, see	1814	8		CHEMICAL KIT	3316	9	
Caustic soda, see	1824	8		CHEMICAL SAMPLE, TOXIC	3315	6.1	
Caustic soda liquor, see	1824	8		Chile saltpetre, see	1498	5.1	
CELLS, CONTAINING SODIUM	3292	4.3		CHLORAL, ANHYDROUS, STABILIZED	2075	6.1	
CELLULOID in block, rods, rolls, sheets, tubes, etc., except scrap	2000	4.1		CHLORATE AND BORATE MIXTURE	1458	5.1	
CELLULOID, SCRAP	2002	4.2		CHLORATE AND MAGNESIUM CHLORIDE MIXTURE, SOLID	1459	5.1	
Cement, see	1133	3					
CERIUM, slabs, ingots or rods	1333	4.1		CHLORATE AND MAGNESIUM CHLORIDE MIXTURE, SOLUTION	3407	5.1	
CERIUM, turnings or gritty powder	3078	4.3					
Cer mishmetall, see	1323	4.1		CHLORATES, INORGANIC, N.O.S.	1461	5.1	
Charcoal, activated, see	1362	4.1		CHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	3210	5.1	
Charcoal, non-activated, see	1361	4.2					
CHARGES, BURSTING, PLASTICS BONDED	0457 0458 0459 0460	1 1 1 1		CHLORIC ACID, AQUEOUS SOLUTION with not more than 10% chloric acid	2626	5.1	
CHARGES, DEMOLITION	0048	1		CHLORINE	1017	2	
CHARGES, DEPTH	0056	1		CHLORINE PENTAFLUORIDE	2548	2	
Charges, expelling, explosive, for fire extinguishers, see	0275 0276 0323 0381	1 1 1 1		CHLORINE TRIFLUORIDE	1749	2	
				CHLORITES, INORGANIC, N.O.S.	1462	5.1	
				CHLORITE SOLUTION	1908	8	
CHARGES, EXPLOSIVE, COMMERCIAL without detonator	0442 0443 0444 0445	1 1 1 1		Chloroacetaldehyde, see	2232	6.1	
				CHLOROACETIC ACID, MOLTEN	3250	6.1	
				CHLOROACETIC ACID, SOLID	1751	6.1	
CHARGES, PROPELLING	0271 0272 0415 0491	1 1 1 1		CHLOROACETIC ACID SOLUTION	1750	6.1	
				CHLOROACETONE, STABILIZED	1695	6.1	
CHARGES, PROPELLING, FOR CANNON	0242 0279 0414	1 1 1		CHLOROACETONITRILE	2668	6.1	
				CHLOROACETOPHENONE, LIQUID	3416	6.1	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
CHLOROACETOPHENONE, SOLID	1697	6.1		Chloroethane nitrile, see	2668	6.1	
CHLOROACETYL CHLORIDE	1752	6.1		2-Chloroethanol, see	1135	6.1	
CHLOROANILINES, LIQUID	2019	6.1		CHLOROFORM	1888	6.1	
CHLOROANILINES, SOLID	2018	6.1		CHLOROFORMATES, TOXIC, CORROSIVE, N.O.S.	3277	6.1	
CHLOROANISIDINES	2233	6.1		CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.	2742	6.1	
CHLOROBENZENE	1134	3		Chloromethane, see	1063	2	
CHLOROBENZOTRIFLUORIDES	2234	3		1-Chloro-3-methylbutane, see	1107	3	
CHLOROBENZYL CHLORIDES, LIQUID	2235	6.1		2-Chloro-2-methylbutane, see	1107	3	
CHLOROBENZYL CHLORIDES, SOLID	3427	6.1		CHLOROMETHYL CHLOROFORMATE	2745	6.1	
1-Chloro-3-bromopropane, see	2688	6.1		Chloromethyl cyanide, see	2668	6.1	
1-Chlorobutane, see	1127	3		CHLOROMETHYL ETHYL ETHER	2354	3	
2-Chlorobutane, see	1127	3		1-Chloro-3-methylbutane, see	1107	3	
CHLOROBUTANES	1127	3		1-Chloro-3-methylbutane, see	1107	3	
CHLOROCRESOLS, SOLUTION	2669	6.1		Chloromethyl methyl ether, see	1239	6.1	
CHLOROCRESOLS, SOLID	3437	6.1		3-CHLORO-4-METHYLPHENYL ISOCYANATE, LIQUID	2236	6.1	
CHLORODIFLUORO-BROMOMETHANE	1974	2		3-CHLORO-4-METHYLPHENYL ISOCYANATE, SOLID	3428	6.1	
1-CHLORO-1,1-DIFLUORO-ETHANE	2517	2		1-Chloro-2-methylpropane, see	1127	3	
CHLORODIFLUOROMETHANE	1018	2		2-Chloro-2-methylpropane, see	1127	3	
CHLORODIFLUORO-METHANE AND CHLORO-PENTAFLUOROETHANE MIXTURE with fixed boiling point, with approximately 49% chlorodifluoromethane	1973	2		3-Chloro-2-methylprop-1-ene, see	2554	3	
3-Chloro-1,2-dihydroxypropane, see	2689	6.1		CHLORONITROANILINES	2237	6.1	
Chlorodimethyl ether, see	1239	6.1		CHLORONITROBENZENES LIQUID	3409	6.1	
1Chloro-2,2-dimethylpropane, see	1107	3		CHLORONITROBENZENES SOLID	1578	6.1	
CHLORODINITROBENZENES, LIQUID	1577	6.1		CHLORONITROTOLUENES, LIQUID	2433	6.1	
CHLORODINITROBENZENES, SOLID	3441	6.1		CHLORONITROTOLUENES, SOLID	3457	6.1	
2-CHLOROETHANAL	2232	6.1		CHLOROPENTAFLUORO-ETHANE	1020	2	
Chloroethane, see	1037	2		1-Chloropentane	1107	3	
				CHLOROPHENOLATES, LIQUID	2904	8	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
CHLOROPHENOLATES, SOLID	2905	8		CHLOROSULPHONIC ACID (with or without sulphur trioxide)	1754	8	
CHLOROPHENOLS, LIQUID	2021	6.1		1-CHLORO-1,2,2,2-TETRAFLUOROETHANE	1021	2	
CHLOROPHENOLS, SOLID	2020	6.1		CHLOROTOLUENES	2238	3	
CHLOROPHENYL-TRICHLOROSILANE	1753	8		4-CHLORO-o-TOLUIDINE HYDROCHLORIDE, SOLID	1579	6.1	
CHLOROPICRIN	1580	6.1		4-CHLORO-o-TOLUIDINE HYDROCHLORIDE, SOLUTION	3410	6.1	
CHLOROPICRIN AND METHYL BROMIDE MIXTURE, with more than 2% chloropicrin	1581	2		CHLOROTOLUIDINES LIQUID	3429	6.1	
CHLOROPICRIN AND METHYL CHLORIDE MIXTURE	1582	2		CHLOROTOLUIDINES SOLID	2239	6.1	
CHLOROPICRIN MIXTURE, N.O.S.	1583	6.1		1-CHLORO-2,2,2-TRIFLUOROETHANE	1983	2	
CHLOROPLATINIC ACID, SOLID	2507	8		Chlorotrifluoroethylene, see	1082	2	
CHLOROPRENE, STABILIZED	1991	3		CHLOROTRIFLUOROMETHANE	1022	2	
1-CHLOROPROPANE	1278	3		CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE with approximately 60% chlorotrifluoromethane	2599	2	
2-CHLOROPROPANE	2356	3					
3-Chloro-propanediol-1,2, see	2689	6.1		Chromic acid, solid, see	1463	5.1	
3-CHLOROPROPANOL-1	2849	6.1		CHROMIC ACID SOLUTION	1755	8	
2-CHLOROPROPENE	2456	3		Chromic anhydride, solid, see	1463	5.1	
3-Chloropropene, see	1100	3		CHROMIC FLUORIDE, SOLID	1756	8	
3-Chloroprop-1-ene, see	1100	3		CHROMIC FLUORIDE SOLUTION	1757	8	
2-CHLOROPROPIONIC ACID	2511	8		Chromic nitrate, see	2720	5.1	
2-CHLOROPYRIDINE	2822	6.1		Chromium (VI) dichloride dioxide, see	1758	8	
CHLOROSILANES, CORROSIVE, N.O.S.	2987	8		Chromium (III) fluoride, solid, see	1756	8	
CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S.	2986	8		CHROMIUM NITRATE	2720	5.1	
CHLOROSILANES, FLAMMABLE, CORROSIVE, N.O.S.	2985	3		Chromium (III) nitrate, see	2720	5.1	
CHLOROSILANES, TOXIC, CORROSIVE, N.O.S.	3361	6.1		CHROMIUM OXYCHLORIDE	1758	8	
CHLOROSILANES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.	3362	6.1		CHROMIUM TRIOXIDE, ANHYDROUS	1463	5.1	
CHLOROSILANES, WATER-REACTIVE, FLAMMABLE, CORROSIVE, N.O.S.	2988	4.3		CHROMOSULPHURIC ACID	2240	8	
				Chryosotile, see	2590	9	
				Cinene, see	2052	3	
				Cinnamene, see	2055	3	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
Cinnamol, see	2055	3		COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S.	3303	2	
CLINICAL WASTE, UNSPECIFIED, N.O.S.	3291	6.2		COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	3306	2	
COAL GAS, COMPRESSED	1023	2		CONTRIVANCES, WATER-ACTIVATED with burster, expelling charge or propelling charge	0248 0249	1 1	
COAL TAR DISTILLATES, FLAMMABLE	1136	3		COPPER ACETOARSENITE	1585	6.1	
Coal tar naphtha, see	1268	3		COPPER ARSENITE	1586	6.1	
Coal tar oil, see	1136	3		Copper (II) arsenite, see	1586	6.1	
COATING SOLUTION (includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining)	1139	3		COPPER BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2776	3	
COBALT NAPHTHENATES, POWDER	2001	4.1		COPPER BASED PESTICIDE, LIQUID, TOXIC	3010	6.1	
COBALT RESINATE, PRECIPITATED	1318	4.1		COPPER BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3009	6.1	
Cocculus, see	3172 3462	6.1 6.1		COPPER BASED PESTICIDE, SOLID, TOXIC	2775	6.1	
Collodion cottons, see	0340 0341 0342 2059 2555 2556 2557	1 1 1 3 4.1 4.1 4.1		COPPER CHLORATE	2721	5.1	
				Copper (II) chlorate, see	2721	5.1	
				COPPER CHLORIDE	2802	8	
				COPPER CYANIDE	1587	6.1	
COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	0382 0383 0384 0461	1 1 1 1		Copper selenate, see	2630	6.1	
				Copper selenite, see	2630	6.1	
Composition B, see	0118	1		COPRA	1363	4.2	
COMPRESSED GAS, N.O.S.	1956	2		CORD, DETONATING, flexible	0065 0289	1 1	
COMPRESSED GAS, FLAMMABLE, N.O.S.	1954	2		CORD, DETONATING, metal clad	0102 0290	1 1	
COMPRESSED GAS, OXIDIZING, N.O.S.	3156	2		CORD, DETONATING, MILD EFFECT, metal clad	0104	1	
COMPRESSED GAS, TOXIC, N.O.S.	1955	2		CORD, IGNITER	0066	1	
COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.	3304	2		Cordite, see	0160 0161	1 1	
COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.	1953	2		CORROSIVE LIQUID, N.O.S.	1760	8	
COMPRESSED GAS, TOXIC, N.O.S.	3305	2		CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	3264	8	
COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.				CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.	3265	8	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	3266	8		COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3025	6.1	
CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	3267	8		COUMARIN DERIVATIVE PESTICIDE, SOLID, TOXIC	3027	6.1	
CORROSIVE LIQUID, FLAMMABLE, N.O.S.	2920	8		Creosote, see	2810	6.1	
CORROSIVE LIQUID, OXIDIZING, N.O.S.	3093	8		Creosote salts, see	1334	4.1	
CORROSIVE LIQUID, SELF-HEATING, N.O.S.	3301	8		CRESOLS, LIQUID	2076	6.1	
CORROSIVE LIQUID, TOXIC, N.O.S.	2922	8		CRESOLS, SOLID	3455	6.1	
CORROSIVE LIQUID, WATER-REACTIVE, N.O.S.	3094	8		CRESYLIC ACID	2022	6.1	
CORROSIVE SOLID, N.O.S.	1759	8		Crocidolite, see	2212	9	
CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.	3260	8		CROTONALDEHYDE	1143	6.1	
CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.	3261	8		CROTONALDEHYDE, STABILIZED	1143	6.1	
CORROSIVE SOLID, BASIC, INORGANIC, N.O.S.	3262	8		CROTONIC ACID, LIQUID	3472	8	
CORROSIVE SOLID, BASIC, ORGANIC, N.O.S.	3263	8		CROTONIC ACID, SOLID	2823	8	
CORROSIVE SOLID, FLAMMABLE, N.O.S.	2921	8		Crotonic aldehyde / Crotonic aldehyde, stabilized, see	1143	6.1	
CORROSIVE SOLID, OXIDIZING, N.O.S.	3084	8		CROTONYLENE	1144	3	
CORROSIVE SOLID, SELF-HEATING, N.O.S.	3095	8		Crude naphtha, see	1268	3	
CORROSIVE SOLID, TOXIC, N.O.S.	2923	8		Cumene, see	1918	3	
CORROSIVE SOLID, WATER-REACTIVE, N.O.S.	3096	8		Cupric chlorate, see	2721	5.1	
COTTON WASTE, OILY	1364	4.2		CUPRIETHYLENEDIAMINE SOLUTION	1761	8	
COTTON, WET	1365	4.2		Cut backs, with a flash-point not greater than 60 °C, see	1999	3	
COUMARIN DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3024	3		Cut backs, with a flash-point above 60 °C, at or above its flash-point, see	3256	3	
COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC	3026	6.1		Cut backs, at or above 100 °C and below its flash-point, see	3257	9	
				CUTTERS, CABLE, EXPLOSIVE	0070	1	
				CYANIDE SOLUTION, N.O.S.	1935	6.1	
				CYANIDES, INORGANIC, SOLID, N.O.S.	1588	6.1	
				Cyanides, organic, flammable, toxic, n.o.s., see	3273	3	
				Cyanides, organic, toxic, n.o.s., see	3276	6.1	
					3439	6.1	

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Cyanides, organic, toxic, flammable, n.o.s., see	3275	6.1		CYCLONITE, WETTED with not less than 15% water, by mass, see	0072	1	
Cyanoacetonitrile, see	2647	6.1		CYCLOOCTADIENES	2520	3	
CYANOGEN	1026	2		CYCLOOCTADIENE PHOSPHINES, see	2940	4.2	
CYANOGEN BROMIDE	1889	6.1		CYCLOOCTATETRAENE	2358	3	
CYANOGEN CHLORIDE, STABILIZED	1589	2		CYCLOPENTANE	1146	3	
CYANURIC CHLORIDE	2670	8		CYCLOPENTANOL	2244	3	
CYCLOBUTANE	2601	2		CYCLOPENTANONE	2245	3	
CYCLOBUTYL CHLOROFORMATE	2744	6.1		CYCLOPENTENE	2246	3	
1,5,9-CYCLODODECATRIENE	2518	6.1		CYCLOPROPANE	1027	2	
CYCLOHEPTANE	2241	3		CYCLOTETRAMETHYLENE- TETRANITRAMINE, DESENSITIZED	0484	1	
CYCLOHEPTATRIENE	2603	3		CYCLOTETRAMETHYLENE- TETRANITRAMINE, WETTED with not less than 15% water, by mass	0226	1	
1,3,5-Cycloheptatriene, see	2603	3					
CYCLOHEPTENE	2242	3					
1,4-Cyclohexadienedione, see	2587	6.1		CYCLOTRIMETHYLENE- TRINITRAMINE AND CYCLOTETRAMETHYLENE- TETRANITRAMINE MIXTURE, DESENSITIZED with not less than 10% phlegmatiser by mass	0391	1	
CYCLOHEXANE	1145	3					
Cyclehexanethiol, see	3054	3					
CYCLOHEXANONE	1915	3		CYCLOTRIMETHYLENE- TRINITRAMINE AND CYCLOTETRAMETHYLENE- TETRANITRAMINE MIXTURE, WETTED with not less than 15% water, by mass	0391	1	
CYCLOHEXENE	2256	3					
CYCLOHEXENYLTRI- CHLOROSILANE	1762	8		CYCLOTRIMETHYLENE- TRINITRAMINE, DESENSITIZED	0483	1	
CYCLOHEXYL ACETATE	2243	3					
CYCLOHEXYLAMINE	2357	8		CYCLOTRIMETHYLENE- TRINITRAMINE, WETTED with not less than 15% water, by mass	0072	1	
CYCLOHEXYL ISOCYANATE	2488	6.1					
CYCLOHEXYL MERCAPTAN	3054	3		CYMENES	2046	3	
CYCLOHEXYLTRI- CHLOROSILANE	1763	8		Cymol, see	2046	3	
CYCLONITE AND CYCLOTETRAMETHYLENE- TETRANITRAMINE MIXTURE, WETTED with not less than 15% water, by mass or DESENSITIZED with not less than 10% phlegmatiser by mass, see	0391	1		Deanol, see	2051	8	
				Dangerous goods in machinery or dangerous goods in apparatus	3363	9	Not subject to ADN [see also 1.1.3.1 (b)]
				DECABORANE	1868	4.1	
CYCLONITE, DESENSITIZED, see	0483	1		DECAHYDRONAPHTHALENE	1147	3	

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Decalin, see	1147	3		DIAZODINITROPHENOL, WETTED with not less than 40% water, or mixture of alcohol and water, by mass	0074	1	
n-DECANE	2247	3		Dibenzopyridine, see	2713	6.1	
DEFLAGRATING METAL SALTS OF AROMATIC NITRODERIVATIVES, N.O.S.	0132	1		DIBENZYL-DICHLOROSILANE	2434	8	
Depth charge, see	0056	1		DIBORANE	1911	2	
DESENSITIZED EXPLOSIVE, LIQUID, N.O.S.	3379	3		1,2-DIBROMOBUTAN-3-ONE	2648	6.1	
DESENSITIZED EXPLOSIVE, SOLID, N.O.S.	3380	4.1		DIBROMOCHLOROPROPANES	2872	6.1	
Detonating relays, see	0029	1		1,2-Dibromo-3-chloropropane, see	2872	6.1	
	0267	1		DIBROMODIFLUORO-METHANE	1941	9	
	0360	1		DIBROMOMETHANE	2664	6.1	
	0361	1		DI-n-BUTYLAMINE	2248	8	
	0455	1					
	0500	1		DIBUTYLAMINOETHANOL	2873	6.1	
DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	0360	1		2-Dibutylaminoethanol, see	2873	6.1	
	0361	1					
	0500	1		N,N-Di-n-butylaminoethanol, see	2873	6.1	
DETONATORS FOR AMMUNITION	0073	1		DIBUTYL ETHERS	1149	3	
	0364	1		DICHLOROACETIC ACID	1764	8	
	0365	1		1,3-DICHLOROACETONE	2649	6.1	
	0366	1		DICHLOROACETYL CHLORIDE	1765	8	
DETONATORS, ELECTRIC for blasting	0030	1		DICHLOROANILINES, LIQUID	1590	6.1	
	0255	1		DICHLOROANILINES, SOLID	3442	6.1	
	0456	1		o-DICHLOROBENZENE	1591	6.1	
DETONATORS, NON-ELECTRIC for blasting	0029	1		2,2'-DICHLORODIETHYL ETHER	1916	6.1	
	0267	1		DICHLORODIFLUORO- METHANE	1028	2	
	0455	1		DICHLORODIFLUORO- METHANE AND 1,1- DIFLUOROETHANE AZEOTROPIC MIXTURE with approximately 74% dichlorodifluoromethane	2602	2	
DEUTERIUM, COMPRESSED	1957	2					
DEVICES, SMALL, HYDROCARBON GAS POWERED with release device	3150	2		Dichlorodifluoromethane and ethylene oxide mixture, see	3070	2	
DIACETONE ALCOHOL	1148	3		DICHLORODIMETHYL ETHER, SYMMETRICAL	2249	6.1	Carriage prohi- bited
DIALKYL-(C ₁₂ -C ₁₈)-DIMETHYL- AMMONIUM and 2-PROPANOL	3175	4.1		1,1-DICHLOROETHANE	2362	3	
DIALLYLAMINE	2359	3		1,2-Dichloroethane, see	1184	3	
DIALLYL ETHER	2360	3					
4,4'-DIAMINODIPHENYL- METHANE	2651	6.1					
1,2-Diaminoethane, see	1604	8					
Diaminopropylamine, see	2269	8					
DI-n-AMYLAMINE	2841	3					

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1,2-DICHLOROETHYLENE	1150	3		1,1-Diethoxyethane, see	1088	3	
Di(2-chloroethyl) ether, see	1916	6.1		1,2-Diethoxyethane, see	1153	3	
DICHLOROFUOROMETHANE	1029	2		DIETHOXYMETHANE	2373	3	
alpha-Dichlorohydrin, see	2750	6.1		3,3-DIETHOXYPROPENE	2374	3	
DICHLOROISOCYANURIC ACID, DRY	2465	5.1		DIETHYLAMINE	1154	3	
DICHLOROISOCYANURIC ACID SALTS	2465	5.1		2-DIETHYLAMINOETHANOL	2686	8	
DICHLOROISOPROPYL ETHER	2490	6.1		3-DIETHYL-AMINOPROPYLAMINE	2684	3	
DICHLOROMETHANE	1593	6.1		N,N-DIETHYLANILINE	2432	6.1	
1,1-DICHLORO-1-NITROETHANE	2650	6.1		DIETHYLBENZENE	2049	3	
DICHLOROPENTANES	1152	3		Diethylcarbinol, see	1105	3	
Dichlorophenol, see	2020 2021	6.1 6.1		DIETHYL CARBONATE	2366	3	
DICHLOROPHENYL ISOCYANATES	2250	6.1		DIETHYLDICHLOROSILANE	1767	8	
DICHLOROPHENYLTRI-CHLOROSILANE	1766	8		Diethylenediamine, see	2579	8	
1,2-DICHLOROPROPANE	1279	3		DIETHYLENEGLYCOL DINITRATE, DESENSITIZED with not less than 25% non-volatile, water-insoluble phlegmatizer, by mass	0075	1	
1,3-DICHLORO-PROPANOL-2	2750	6.1		DIETHYLENETRIAMINE	2079	8	
1,3-Dichloro-2-propanone, see	2649	6.1		N,N-Diethylethanolamine, see	2686	3	
DICHLOROPROPENES	2047	3		DIETHYL ETHER	1155	3	
DICHLOROSILANE	2189	2		N,N-DIETHYLETHYLENE-DIAMINE	2685	8	
1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE	1958	2		Di-(2-ethylhexyl) phosphoric acid, see	1902	8	
Dichloro-s-triazine-2,4,6-trione, see	2465	5.1		DIETHYL KETONE	1156	3	
1,4-Dicyanobutane, see	2205	6.1		DIETHYL SULPHATE	1594	6.1	
Dicycloheptadiene, see	2251	3		DIETHYL SULPHIDE	2375	3	
DICYCLOHEXYLAMINE	2565	8		DIETHYLTHIOPHOSPHORYL CHLORIDE	2751	8	
Dicyclohexylamine nitrite, see	2687	4.1		Diethylzinc, see	3394	4.2	
DICYCLOHEXYLAMMONIUM NITRITE	2687	4.1		2,4-Difluoroaniline, see	2941	6.1	
DICYCLOPENTADIENE	2048	3		Difluorochloroethane, see	2517	2	
1,2-DI-(DIMETHYLAMINO) ETHANE	2372	3		1,1-DIFLUOROETHANE	1030	2	
DIDYMIUM NITRATE	1465	5.1		1,1-DIFLUOROETHYLENE	1959	2	
DIESEL FUEL	1202	3		DIFLUOROMETHANE	3252	2	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 10% difluoromethane and 70% pentafluoroethane, see	3339	2		N,N-DIMETHYLANILINE	2253	6.1	
				Dimethylarsenic acid, see	1572	6.1	
				N,N-Dimethylbenzylamine, see	2619	8	
Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 20% difluoromethane and 40% pentafluoroethane, see	3338	2		2,3-DIMETHYLBUTANE	2457	3	
				1,3-DIMETHYLBUTYLAMINE	2379	3	
				DIMETHYLCARBAMOYL CHLORIDE	2262	8	
Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 23% difluoromethane and 25% pentafluoroethane, see	3340	2		DIMETHYL CARBONATE	1161	3	
				DIMETHYLCYCLOHEXANES	2263	3	
DIFLUOROPHOSPHORIC ACID, ANHYDROUS	1768	8		N,N-DIMETHYLCYCLOHEXYLAMINE	2264	8	
2,3-DIHYDROPYRAN	2376	3		DIMETHYLDICHLOROSILANE	1162	3	
				DIMETHYLDIETHOXYSILANE	2380	3	
DIISOBUTYLAMINE	2361	3		DIMETHYLDIOXANES	2707	3	
DIISOBUTYLENE, ISOMERIC COMPOUNDS	2050	3		DIMETHYL DISULPHIDE	2381	3	
alpha-Diisobutylene, see	2050	3		Dimethylethanolamine, see	2051	8	
beta-Diisobutylene, see	2050	3		DIMETHYL ETHER	1033	2	
DIISOBUTYL KETONE	1157	3		N,N-DIMETHYLFORMAMIDE	2265	3	
DIISOCTYL ACID PHOSPHATE	1902	8		DIMETHYLHYDRAZINE, SYMMETRICAL	2382	6.1	
DIISOPROPYLAMINE	1158	3		DIMETHYLHYDRAZINE, UNSYMMETRICAL	1163	6.1	
DIISOPROPYL ETHER	1159	3		1,1-Dimethylhydrazine, see	1163	6.1	
DIKETENE, STABILIZED	2521	6.1		N,N-Dimethyl-4-nitrosoaniline, see	1369	4.2	
1,1-DIMETHOXYETHANE	2377	3		2,2-DIMETHYLPROPANE	2044	2	
1,2-DIMETHOXYETHANE	2252	3		DIMETHYL-N-PROPYLAMINE	2266	3	
Dimethoxystrychnine, see	1570	6.1		DIMETHYL SULPHATE	1595	6.1	
DIMETHYLAMINE, ANHYDROUS	1032	2		DIMETHYL SULPHIDE	1164	3	
DIMETHYLAMINE AQUEOUS SOLUTION	1160	3		DIMETHYL THIOPHOSPHORYL CHLORIDE	2267	6.1	
2-DIMETHYLAMINO-ACETONITRILE	2378	3		Dimethylzinc, see	3394	4.2	
				DINGU, see	0489	1	
2-DIMETHYLAMINOETHANOL	2051	8		DINITROANILINES	1596	6.1	
2-DIMETHYLAMINOETHYL ACRYLATE	3302	6.1		DINITROBENZENES, LIQUID	1597	6.1	
				DINITROBENZENES, SOLID	3443	6.1	
2-DIMETHYLAMINOETHYL METHACRYLATE	2522	6.1		Dinitrochlorobenzene, see	1577	6.1	
					3441	6.1	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
DINITRO-o-CRESOL	1598	6.1		DIPICRYLAMINE, see	0079	1	
DINITROGEN TETROXIDE	1067	2		DIPICRYL SULPHIDE, dry or wetted with less than 10% water, by mass	0401	1	
DINITROGLYCOLURIL	0489	1		DIPICRYL SULPHIDE, WETTED with not less than 10% water, by mass	2852	4.1	
DINITROPHENOL, dry or wetted with less than 15% water, by mass	0076	1		DIPROPYLAMINE	2383	3	
DINITROPHENOL SOLUTION	1599	6.1		Dipropylene triamine, see	2269	8	
DINITROPHENOL, WETTED with not less than 15% water, by mass	1320	4.1		DI-n-PROPYL ETHER	2384	3	
DINITROPHENOLATES, alkali metals, dry or wetted with less than 15% water, by mass	0077	1		DIPROPYL KETONE	2710	3	
DINITROPHENOLATES, WETTED with not less than 15% water, by mass	1321	4.1		DISINFECTANT, LIQUID, CORROSIVE, N.O.S.	1903	8	
DINITRORESORCINOL, dry or wetted with less than 15% water, by mass	0078	1		DISINFECTANT, LIQUID, TOXIC, N.O.S.	3142	6.1	
DINITRORESORCINOL, WETTED with not less than 15% water, by mass	1322	4.1		DISINFECTANT, SOLID, TOXIC, N.O.S.	1601	6.1	
DINITROSOBENZENE	0406	1		DISODIUM TRIOXOSILICATE	3253	8	
Dinitrotoluene mixed with sodium chlorate, see	0083	1		DIVINYL ETHER, STABILIZED	1167	3	
DINITROTOLUENES, LIQUID	2038	6.1		DODECYLTRICHLOROSILANE	1771	8	
DINITROTOLUENES, MOLTEN	1600	6.1		Dry ice, see	1845	9	Not subject to ADN
DINITROTOLUENES, SOLID	3454	6.1		DYE INTERMEDIATE, LIQUID, CORROSIVE, N.O.S.	2801	8	
DIOXANE	1165	3		DYE INTERMEDIATE, LIQUID, TOXIC, N.O.S.	1602	6.1	
DIOXOLANE	1166	3		DYE INTERMEDIATE, SOLID, CORROSIVE, N.O.S.	3147	8	
DIPENTENE	2052	3		DYE INTERMEDIATE, SOLID, TOXIC, N.O.S.	3143	6.1	
DIPHENYLAMINE CHLOROARSINE	1698	6.1		DYE, LIQUID, CORROSIVE, N.O.S.	2801	8	
DIPHENYLCHLOROARSINE, LIQUID	1699	6.1		DYE, LIQUID, TOXIC, N.O.S.	1602	6.1	
DIPHENYLCHLOROARSINE, SOLID	3450	6.1		DYE, SOLID, CORROSIVE, N.O.S.	3147	8	
DIPHENYLDICHLOROSILANE	1769	8		DYE, SOLID, TOXIC, N.O.S.	3143	6.1	
DIPHENYLMETHANE-4, 4'-DIISOCYANATE	9004	9	Dangerous in tank vessels only	Dynamite, see	0081	1	
				Electric storage batteries, see	2794	8	
					2795	8	
					2800	8	
DIPHENYLMETHYL BROMIDE	1770	8			3028	8	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
Electrolyte (acid or alkaline) for batteries, see	2796	8		Engines, rocket, see	0250	1	
	2797	8			0322	1	
ELEVATED TEMPERATURE LIQUID, N.O.S., at or above 100 °C and below its flash-point (including molten metals, molten salts, etc.)	3257	9		ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	3082	9	
ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point	3256	3		ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.	3077	9	
				EPIBROMOHYDRIN	2558	6.1	
ELEVATED TEMPERATURE SOLID, N.O.S., at or above 240 °C	3258	9		EPICHLOROHYDRIN	2023	6.1	
				1,2-Epoxybutane, stabilized, see	3022	3	
Empty battery-vehicle, uncleaned			See	Epoxyethane, see	1040	2	
			4.3.2.4 of ADR, 5.1.3 and 5.4.1.1.6	1,2-EPOXY-3-ETHOXYPROPANE	2752	3	
Empty IBC, uncleaned			See	2,3-Epoxy-1-propanal, see	2622	3	
			4.1.1.11 of ADR, 5.1.3 and 5.4.1.1.6	2,3-Epoxypropyl ethyl ether, see	2752	3	
Empty large packaging, uncleaned			See	ESTERS, N.O.S.	3272	3	
			4.1.1.11 of ADR, 5.1.3 and 5.4.1.1.6	Ethanal, see	1089	3	
Empty MEGC, uncleaned			See	ETHANE	1035	2	
			4.3.2.4 of ADR, 5.1.3 and 5.4.1.1.6	ETHANE, REFRIGERATED LIQUID	1961	2	
Empty packaging, uncleaned			See	Ethanethiol, see	2363	3	
			4.1.1.11 of ADR, 5.1.3 and 5.4.1.1.6	ETHANOL	1170	3	
Empty receptacle, uncleaned			See 5.1.3 and 5.4.1.1.6	ETHANOL AND GASOLINE MIXTURE or ETHANOL AND MOTOR SPIRIT MIXTURE or ETHANOL AND PETROL MIXTURE, with more than 10% ethanol	3475	3	
			See 5.1.3 and 5.4.1.1.6	ETHANOL SOLUTION	1170	3	
Empty tank, uncleaned			See 5.1.3 and 5.4.1.1.6	ETHANOLAMINE	2491	8	
			See 5.1.3 and 5.4.1.1.6	ETHANOLAMINE SOLUTION	2491	8	
Empty vehicle, uncleaned			See 5.1.3 and 5.4.1.1.6	Ether, see	1155	3	
			See 5.1.3 and 5.4.1.1.6	ETHERS, N.O.S.	3271	3	
Enamel, see	1263	3		2-Ethoxyethanol, see	1171	3	
				3066	8		2-Ethoxyethyl acetate, see
Engines, internal combustion	3469	3		Ethoxy propane-1, see	2615	3	
	3470	8		ETHYL ACETATE	1173	3	
Engines, internal combustion	3166	9	Not subject to ADN	ETHYLACETYLENE, STABILIZED	2452	2	

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ETHYL ACRYLATE, STABILIZED	1917	3		ETHYLENE, ACETYLENE AND PROPYLENE MIXTURE, REFRIGERATED LIQUID containing at least 71.5% ethylene with not more than 22.5% acetylene and not more than 6% propylene	3138	2	
ETHYL ALCOHOL, see	1170	3					
ETHYL ALCOHOL SOLUTION, see	1170	3					
ETHYLAMINE	1036	2		ETHYLENE CHLOROHYDRIN	1135	6.1	
ETHYLAMINE, AQUEOUS SOLUTION with not less than 50% but not more than 70% ethylamine	2270	3		ETHYLENE	1962	2	
				ETHYLENEDIAMINE	1604	8	
ETHYL AMYL KETONE	2271	3		ETHYLENE DIBROMIDE	1605	6.1	
N-ETHYLANILINE	2272	6.1		Ethylene dibromide and methyl bromide, liquid mixture, see	1647	6.1	
2-ETHYLANILINE	2273	6.1					
ETHYLBENZENE	1175	3		ETHYLENE DICHLORIDE	1184	3	
N-ETHYL-N-BENZYLANILINE	2274	6.1		ETHYLENE GLYCOL DIETHYL ETHER	1153	3	
N-ETHYLBENZYL TOLUIDINES, LIQUID	2753	6.1		ETHYLENE GLYCOL MONOETHYL ETHER	1171	3	
N-ETHYLBENZYL TOLUIDINES, SOLID	3460	6.1		ETHYLENE GLYCOL MONOETHYL ETHER ACETATE	1172	3	
ETHYL BORATE	1176	3		ETHYLENE GLYCOL MONOMETHYL ETHER	1188	3	
ETHYL BROMIDE	1891	6.1					
ETHYL BROMOACETATE	1603	6.1		ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE	1189	3	
2-ETHYLBUTANOL	2275	3					
2-ETHYLBUTYL ACETATE	1177	3		ETHYLENEIMINE, STABILIZED	1185	6.1	
ETHYL BUTYL ETHER	1179	3		ETHYLENE OXIDE	1040	2	
2-ETHYLBUTYRALDEHYDE	1178	3		ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 87% ethylene oxide	3300	2	
ETHYL BUTYRATE	1180	3					
ETHYL CHLORIDE	1037	2		ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 9% but not more than 87% ethylene oxide	1041	2	
ETHYL CHLOROACETATE	1181	6.1					
Ethyl chlorocarbonate, see	1182	6.1		ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with not more than 9% ethylene oxide	1952	2	
ETHYL CHLOROFORMATE	1182	6.1					
ETHYL 2-CHLOROPROPIONATE	2935	3		ETHYLENE OXIDE AND CHLOROTETRAFLUOROETHANE MIXTURE with not more than 8.8% ethylene oxide	3297	2	
Ethyl-alpha-chloropropionate, see	2935	3					
ETHYL CHLOROTHIOFORMATE	2826	8					
ETHYL CROTONATE	1862	3		ETHYLENE OXIDE AND DICHLORODIFLUOROMETHANE MIXTURE with not more than 12.5% ethylene oxide	3070	2	
ETHYLDICHLOROARSINE	1892	6.1					
ETHYLDICHLOROSILANE	1183	4.3					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE with not more than 7.9% ethylene oxide	3298	2		Ethyl sulphate, see	1594	6.1	
ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE, not more than 30% ethylene oxide	2983	3		N-ETHYLTOLUIDINES	2754	6.1	
ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE with not more than 5.6% ethylene oxide	3299	2		ETHYLTRICHLOROSILANE	1196	3	
ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1 MPa (10 bar) at 50 °C	1040	2		EXPLOSIVE, BLASTING, TYPE A	0081	1	
ETHYLENE, REFRIGERATED LIQUID	1038	2		EXPLOSIVE, BLASTING, TYPE B	0082 0331	1 1	
ETHYL ETHER, see	1155	3		EXPLOSIVE, BLASTING, TYPE C	0083	1	
ETHYL FLUORIDE	2453	2		EXPLOSIVE, BLASTING, TYPE D	0084	1	
ETHYL FORMATE	1190	3		EXPLOSIVE, BLASTING, TYPE E	0241 0332	1 1	
2-ETHYLHEXYLAMINE	2276	3		Explosives, emulsion, see	0241 0332	1 1	
2-ETHYLHEXYL CHLOROFORMATE	2748	6.1		Explosive, seismic, see	0081 0082 0083 0331	1 1 1 1	
Ethylidene chloride, see	2362	3		Explosive, slurry, see	0241 0332	1 1	
ETHYL ISOBUTYRATE	2385	3		Explosive, water gel, see	0241 0332	1 1	
ETHYL ISOCYANATE	2481	3		EXTRACTS, AROMATIC, LIQUID	1169	3	
ETHYL LACTATE	1192	3		EXTRACTS, FLAVOURING, LIQUID	1197	3	
ETHYL MERCAPTAN	2363	3		FABRICS, ANIMAL, N.O.S. with oil	1373	4.2	
ETHYL METHACRYLATE, STABILIZED	2277	3		FABRICS IMPREGNATED WITH WEAKLY NITRATED NITROCELLULOSE, N.O.S.	1353	4.1	
ETHYL METHYL ETHER	1039	2		FABRICS, SYNTHETIC, N.O.S. with oil	1373	4.2	
ETHYL METHYL KETONE	1193	3		FABRICS, VEGETABLE, N.O.S. with oil	1373	4.2	
ETHYL NITRITE SOLUTION	1194	3		FERRIC ARSENATE	1606	6.1	
ETHYL ORTHOFORMATE	2524	3		FERRIC ARSENITE	1607	6.1	
ETHYL OXALATE	2525	6.1		FERRIC CHLORIDE, ANHYDROUS	1773	8	
ETHYLPHENYL-DICHLOROSILANE	2435	8		FERRIC CHLORIDE SOLUTION	2582	8	
1-ETHYLPIPERIDINE	2386	3		FERRIC NITRATE	1466	5.1	
ETHYL PROPIONATE	1195	3		FERROCERIUM	1323	4.1	
ETHYL PROPYL ETHER	2615	3					
Ethyl silicate, see	1292	3					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
FERROSILICON with 30% or more but less than 90% silicon	1408	4.3		FIRELIGHTERS, SOLID with flammable liquid	2623	4.1	
FERROUS ARSENATE	1608	6.1		FIREWORKS	0333	1	See 2.2.1.1.7
FERROUS METAL BORINGS in a form liable to self-heating	2793	4.2			0334	1	
					0335	1	
					0336	1	
FERROUS METAL CUTTINGS in a form liable to self-heating	2793	4.2			0337	1	
FERROUS METAL SHAVINGS in a form liable to self-heating	2793	4.2		FIRST AID KIT	3316	9	
FERROUS METAL TURNINGS in a form liable to self-heating	2793	4.2		FISH MEAL, STABILIZED	2216	9	
FERTILIZER AMMONIATING SOLUTION with free ammonia	1043	2		FISH MEAL, UNSTABILIZED	1374	4.2	
Fertilizer with ammonium nitrate, n.o.s., see	2067	5.1		FISH SCRAP, STABILIZED, see	2216	9	
Fibres, animal, burnt wet or damp	1372	4.2	Not subject to ADN	FISH SCRAP, UNSTABILIZED, see	1374	4.2	
FIBRES, ANIMAL, N.O.S. with oil	1373	4.2		FLAMMABLE GAS IN LIGHTERS, see	1057	2	
FIBRES IMPREGNATED WITH WEAKLY NITRATED NITROCELLULOSE, N.O.S.	1353	4.1		FLAMMABLE LIQUID, N.O.S.	1993	3	
FIBRES, SYNTHETIC, N.O.S. with oil	1373	4.2		FLAMMABLE LIQUID, N.O.S.	2924	3	
Fibres, vegetable, burnt wet or damp	1372	4.2	Not subject to ADN	FLAMMABLE LIQUID, TOXIC, N.O.S.	1992	3	
Fibres, vegetable, dry	3360	4.1		FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3286	3	
FIBRES, VEGETABLE, N.O.S. with oil	1373	4.2		FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3286	3	
Filler, liquid, see	1263	3		FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3286	3	
	3066	8		FLAMMABLE SOLID, CORROSIVE, INORGANIC, N.O.S.	3180	4.1	
	3469	3		FLAMMABLE SOLID, CORROSIVE, ORGANIC, N.O.S.	2925	4.1	
	3470	8		FLAMMABLE SOLID, CORROSIVE, ORGANIC, N.O.S.	2925	4.1	
Films, nitrocellulose base, from which gelatin has been removed; film scrap, see	2002	4.2	Not subject to ADN	FLAMMABLE SOLID, INORGANIC, N.O.S.	3178	4.1	
FILMS, NITROCELLULOSE BASE, gelatin coated, except scrap	1324	4.1		FLAMMABLE SOLID, INORGANIC, N.O.S.	1325	4.1	
FIRE EXTINGUISHER CHARGES, corrosive liquid	1774	8		FLAMMABLE SOLID, ORGANIC, N.O.S.	1325	4.1	
Fire extinguisher charges, expelling, explosive, see	0275	1		FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.	3176	4.1	
	0276	1		FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.	3176	4.1	
	0323	1		FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S.	3179	4.1	Carriage prohibited
	0381	1		FLAMMABLE SOLID, TOXIC, ORGANIC, N.O.S.	2926	4.1	
FIRE EXTINGUISHERS with compressed or liquefied gas	1044	2		FLARES, AERIAL	0093	1	
					0403	1	
					0404	1	
					0420	1	
					0421	1	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks	
Flares, aeroplane, see	0093	1		Formalin, see	1198	3		
	0403	1			2209	8		
	0404	1		Formamidine sulphinic acid, see	3341	4.2		
	0420	1			FORMIC ACID with more than 85% acid by mass	1779	8	
	0421	1			FORMIC ACID with not more than 85% acid by mass	3412	8	
Flares, highway, Flares, distress, small, Flares, railway or highway, see	0191	1		Formic aldehyde, see	1198	3		
	0373	1		2209	8			
FLARES, SURFACE	0092	1		2-Formyl-3,4-dihydro-2H-pyran, see	2607	3		
	0418	1			FRACTURING DEVICES, EXPLOSIVE without detonator, for oil wells	0099	1	
	0419	1		FUEL, AVIATION, TURBINE ENGINE	1863	3		
Flares, water-activated, see	0248	1		FUEL CELL CARTRIDGES	3478	2		
	0249	1			3479	2		
FLASH POWDER	0094	1		3473	3			
	0305	1		3476	4.3			
Flue dusts, toxic, see	1562	6.1		3477	8			
	Fluoric acid, see	1790	8		FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT	3478	2	
1045		2		3479		2		
FLUORINE, COMPRESSED	1045	2		3473	3			
				3476	4.3			
FLUOROACETIC ACID	2642	6.1		3477	8			
				2941	6.1			
FLUOROANILINES	2941	6.1		3478	2			
				3479	2			
2-Fluoroaniline, see	2941	6.1		3473	3			
				3476	4.3			
4-Fluoroaniline, see	2941	6.1		3477	8			
				2941	6.1			
o-Fluoroaniline, see	2941	6.1		FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT	3478	2		
				3479	2			
p-Fluoroaniline, see	2941	6.1		3473	3			
				3476	4.3			
FLUOROBENZENE	2387	3		3477	8			
				1775	8			
FLUOROBORIC ACID	1775	8		Fumaroyl dichloride, see	1780	3		
				2453	2			
Fluoroethane, see	2453	2		FUMARYL CHLORIDE	1780	8		
				1984	2			
Fluoroform, see	1984	2		FUMIGATED UNIT	3359	9		
				2454	2			
Fluoromethane, see	2454	2		FURALDEHYDES	1199	6.1		
				1776	8			
FLUOROPHOSPHORIC ACID, ANHYDROUS	1776	8		FURAN	2389	3		
				2874	6.1			
FLUOROSILICATES, N.O.S.	2856	6.1		FURFURYL ALCOHOL	2874	6.1		
				2526	3			
FLUOROSILICIC ACID	1778	8		FURFURYLAMINE	2526	3		
				2874	6.1			
FLUOROSULPHONIC ACID	1777	8		Furyl carbinol, see	2874	6.1		
				0102	1			
FLUOROTOLUENES	2388	3		FUSE, DETONATING, metal clad	0102	1		
				0290	1			
FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	2209	8		FUSE, DETONATING, MILD EFFECT, metal clad	0104	1		
				0103	1			
FORMALDEHYDE SOLUTION, FLAMMABLE	1198	3		FUSE, IGNITER, tubular, metal clad	0103	1		
				0101	1			
				FUSEL OIL	1201	3		

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
FUSE, SAFETY	0105	1		GENETICALLY MODIFIED MICROORGANISMS	3245	9	
Fuze, combination, percussion or time, see	0106	1					
	0107	1		GENETICALLY MODIFIED ORGANISMS	3245	9	
	0257	1					
	0316	1					
	0317	1		GERMANE	2192	2	
	0367	1					
	0368	1		Germanium hydride, see	2192	2	
FUZES, DETONATING	0106	1		Glycer-1,3-dichlorohydrin, see	2750	6.1	
	0107	1					
	0257	1		GLYCEROL alpha-MONOCHLOROHYDRIN	2689	6.1	
	0367	1					
FUZES, DETONATING with protective features	0408	1		Glyceryl trinitrate, see	0143	1	
	0409	1			0144	1	
	0410	1			1204	3	
					3064	3	
FUZES, IGNITING	0316	1					
	0317	1		GLYCIDALDEHYDE	2622	3	
	0368	1					
GALLIUM	2803	8		GRENADES, hand or rifle, with bursting charge	0284	1	
					0285	1	
					0292	1	
					0293	1	
GAS CARTRIDGES without a release device, non-refillable, see	2037	2					
Gas drips, hydrocarbon, see	3295	3		Grenades, illuminating, see	0171	1	
					0254	1	
					0297	1	
GAS OIL	1202	3					
GASOLINE	1203	3		GRENADES, PRACTICE, hand or rifle	0110	1	
					0318	1	
					0372	1	
					0452	1	
Gasoline and ethanol mixture, with more than 10% ethanol, see	3475	3					
Gasoline, casinghead, see	1203	3		Grenades, smoke, see	0015	1	
					0016	1	
					0245	1	
					0246	1	
					0303	1	
GAS, REFRIGERATED LIQUID, N.O.S.	3158	2					
GAS, REFRIGERATED LIQUID, FLAMMABLE, N.O.S.	3312	2		GUANIDINE NITRATE	1467	5.1	
GAS, REFRIGERATED LIQUID, OXIDIZING, N.O.S.	3311	2		GUANYLNITROSAMINO-GUANYLIDENE HYDRAZINE, WETTED with not less than 30% water, by mass	0113	1	
GAS SAMPLE, NON-PRESSURIZED, FLAMMABLE, N.O.S., not refrigerated liquid	3167	2					
				GUANYLNITROSAMINO-GUANYLTETRAZENE, WETTED with not less than 30% water, or mixture of alcohol and water, by mass	0114	1	
GAS SAMPLE, NON-PRESSURIZED, TOXIC, N.O.S., not refrigerated liquid	3169	2					
				GUNPOWDER, COMPRESSED, see	0028	1	
GAS SAMPLE, NON-PRESSURIZED, TOXIC, FLAMMABLE, N.O.S., not refrigerated liquid	3168	2					
				GUNPOWDER, granular or as a meal, see	0027	1	
Gelatin, blasting, see	0081	1					
				GUNPOWDER, IN PELLETS, see	0028	1	
Gelatin, dynamites, see	0081	1					
				Gutta percha solution, see	1287	3	

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HAFNIUM POWDER, DRY	2545	4.2		HEXAFLUROETHANE	2193	2	
HAFNIUM POWDER, WETTED with not less than 25% water	1326	4.1		HEXAFLUROPHOSPHORIC ACID	1782	8	
Hay	1327	4.1	Not subject to ADN	HEXAFLUROPROPYLENE	1858	2	
				Hexahydroresol, see	2617	3	
HEATING OIL, LIGHT	1202	3		Hexahydromethyl phenol, see	2617	3	
Heavy hydrogen, see	1957	2		HEXALDEHYDE	1207	3	
HELIUM, COMPRESSED	1046	2		HEXAMETHYLENEDIAMINE, SOLID	2280	8	
HELIUM, REFRIGERATED LIQUID	1963	2		HEXAMETHYLENEDIAMINE SOLUTION	1783	8	
HEPTAFLUROPROPANE	3296	2		HEXAMETHYLENE DIISOCYANATE	2281	6.1	
n-HEPTALDEHYDE	3056	3		HEXAMETHYLENEIMINE	2493	3	
n-Heptanal, see	3056	3		HEXAMETHYLENETETRAMINE	1328	4.1	
HEPTANES	1206	3		Hexamine, see	1328	4.1	
4-Heptanone, see	2710	3		HEXANES	1208	3	
n-HEPTENE	2278	3		HEXANITRODIPHENYL-AMINE	0079	1	
HEXACHLOROACETONE	2661	6.1		HEXANITROSTILBENE	0392	1	
HEXACHLOROBENZENE	2729	6.1		Hexanoic acid, see	2829	8	
HEXACHLOROBUTADIENE	2279	6.1		HEXANOLS	2282	3	
Hexachloro-1,3-butadiene, see	2279	6.1		1-HEXENE	2370	3	
HEXACHLOROCYCLOPENTADIENE	2646	6.1		HEXOGEN AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, WETTED with not less than 15% water, by mass or DESENSITIZED with not less than 10% phlegmatiser by mass, see	0391	1	
HEXACHLOROPHENE	2875	6.1		HEXOGEN, DESENSITIZED, see	0483	1	
Hexachloro-2-propanone, see	2661	6.1		HEXOGEN, WETTED with not less than 15% water, by mass, see	0072	1	
HEXADECYLTRICHLOROSILANE	1781	8		HEXOLITE, dry or wetted with less than 15% water, by mass	0118	1	
HEXADIENES	2458	3		HEXOTOL, dry or wetted with less than 15% water, by mass, see	0118	1	
HEXAETHYL TETRAPHOSPHATE	1611	6.1		HEXOTONAL	0393	1	
HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE	1612	2		HEXOTONAL, cast, see	0393	1	
HEXAFLUROACETONE	2420	2		HEXYL, see	0079	1	
HEXAFLUROACETONE HYDRATE, LIQUID	2552	6.1					
HEXAFLUROACETONE HYDRATE, SOLID	3436	6.1					

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HEXYLTRICHLOROSILANE	1784	8		HYDROGEN AND METHANE MIXTURE, COMPRESSED	2034	2	
HMX, see	0391	1		Hydrogen arsenide, see	2188	2	
HMX, DESENSITIZED, see	0484	1		HYDROGEN BROMIDE, ANHYDROUS	1048	2	
HMX, WETTED with not less than 15% water, by mass, see	0226	1		Hydrogen bromide solution, see	1788	8	
HYDRAZINE, ANHYDROUS	2029	8		HYDROGEN CHLORIDE, ANHYDROUS	1050	2	
HYDRAZINE AQUEOUS SOLUTION, with more than 37% hydrazine by mass	2030	8		HYDROGEN CHLORIDE, REFRIGERATED LIQUID	2186	2	Carriage prohibited
HYDRAZINE, AQUEOUS SOLUTION with not more than 37% hydrazine, by mass	3293	6.1		HYDROGEN, COMPRESSED	1049	2	
Hydrides, metal, water-reactive, n.o.s., see	1409	4.3		HYDROGEN CYANIDE, AQUEOUS SOLUTION with not more than 20% hydrogen cyanide, see	1613	6.1	
Hydriodic acid, anhydrous, see	2197	2		HYDROGEN CYANIDE, SOLUTION IN ALCOHOL with not more than 45% hydrogen cyanide	3294	6.1	
HYDRIODIC ACID	1787	8		HYDROGEN CYANIDE, STABILIZED containing less than 3% water	1051	6.1	
HYDROBROMIC ACID	1788	8		HYDROGEN CYANIDE, STABILIZED, containing less than 3% water and absorbed in a porous inert material	1614	6.1	
HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S.	1964	2		HYDROGENDIFLUORIDES, SOLID, N.O.S.	1740	8	
HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. such as mixtures A, A01, A02, A0, A1, B1, B2, B or C	1965	2		HYDROGENDIFLUORIDES SOLUTION, N.O.S.	3471	8	
HYDROCARBON GAS REFILLS FOR SMALL DEVICES with release device	3150	2		HYDROGEN FLUORIDE, ANHYDROUS	1052	8	
HYDROCARBONS, LIQUID, N.O.S.	3295	3		Hydrogen fluoride solution, see	1790	8	
HYDROCHLORIC ACID	1789	8		HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM	3468	2	
HYDROCYANIC ACID, AQUEOUS SOLUTION with not more than 20% hydrogen cyanide	1613	6.1		HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM CONTAINED IN EQUIPMENT	3468	2	
HYDROFLUORIC ACID with more than 60% but not more than 85% hydrogen fluoride	1790	8		HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM PACKED WITH EQUIPMENT	3468	2	
HYDROFLUORIC ACID with more than 85% hydrogen fluoride	1790	8		HYDROGEN IODIDE, ANHYDROUS	2197	2	
HYDROFLUORIC ACID with not more than 60% hydrogen fluoride	1790	8		Hydrogen iodide solution, see	1787	8	
HYDROFLUORIC ACID AND SULPHURIC ACID MIXTURE	1786	8					
Hydrofluoroboric acid, see	1775	8					
Hydrofluorosilicic acid, see	1778	8					

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HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURE with acid(s), water and not more than 5% peroxyacetic acid, STABILIZED	3149	5.1		IGNITERS	0121	1	
					0314	1	
					0315	1	
					0325	1	
					0454	1	
HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 8% but less than 20% hydrogen peroxide (stabilized as necessary)	2984	5.1		3,3'-IMINODIPROPYLAMINE	2269	8	
				India rubber, see	1287	3	
HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)	2014	5.1		INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only	2900	6.2	
				INFECTIOUS SUBSTANCE, AFFECTING HUMANS	2814	6.2	
HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED with more than 60% hydrogen peroxide and not more than 70% hydrogen peroxide	2015	5.1		Ink, printer's, flammable, see	1210	3	
				INSECTICIDE GAS, N.O.S.	1968	2	
				INSECTICIDE GAS, FLAMMABLE, N.O.S.	3354	2	
HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED with more than 70% hydrogen peroxide	2015	5.1		INSECTICIDE GAS, TOXIC, N.O.S.	1967	2	
				INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.	3355	2	
HYDROGEN, REFRIGERATED LIQUID	1966	2		INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.	3355	2	
HYDROGEN SELENIDE, ANHYDROUS	2202	2		IODINE MONOCHLORIDE	1792	8	
Hydrogen silicide, see	2203	2		IODINE PENTAFLUORIDE	2495	5.1	
				2-iodobutane	2390	3	
HYDROGEN SULPHIDE	1053	2		Iodomethane, see	2644	6.1	
Hydroselenic acid, see	2202	2		IODOMETHYLPROPANES	2391	3	
Hydrosilicofluoric acid, see	1778	8		IODOPROPANES	2392	3	
				alpha-Iodotoluene, see	2653	6.1	
1-HYDROXYBENZOTRIAZOLE, ANHYDROUS, dry or wetted with less than 20% water, by mass	0508	1		I.p.d.i., see	2290	6.1	
1-HYDROXYBENZOTRIAZOLE, ANHYDROUS, WETTED with not less than 20% water, by mass	3474	4.1		Iron chloride, anhydrous, see	1773	8	
				Iron (III) chloride, anhydrous, see	1773	8	
3-Hydroxybutan-2-one, see	2621	3		Iron chloride solution, see	2582	8	
HYDROXYLAMINE SULPHATE	2865	8		IRON OXIDE, SPENT obtained from coal gas purification	1376	4.2	
1-Hydroxy-3-methyl-2-penten-4-yne, see	2705	8		IRON PENTACARBONYL	1994	6.1	
				Iron perchloride, anhydrous, see	1773	8	
3-Hydroxyphenol, see	2876	6.1		Iron powder, pyrophoric, see	1383	4.2	
HYPOCHLORITES, INORGANIC, N.O.S.	3212	5.1		Iron sesquichloride, anhydrous, see	1773	8	
HYPOCHLORITE SOLUTION	1791	8					

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IRON SPONGE, SPENT obtained from coal gas purification	1376	4.2		Isododecane, see	2286	3	
Iron swarf, see	2793	4.2		ISOHEPTENE	2287	3	
ISOBUTANE	1969	2		ISOHEXENE	2288	3	
ISOBUTANOL	1212	3		Isooctane, see	1262	3	
Isobutene, see	1055	2		ISOOCTENE	1216	3	
ISOBUTYL ACETATE	1213	3		Isopentane, see	1265	3	
ISOBUTYL ACRYLATE, STABILIZED	2527	3		ISOPENTENES	2371	3	
ISOBUTYL ALCOHOL, see	1212	3		Isopentylamine, see	1106	3	
ISOBUTYL ALDEHYDE, see	2045	3		Isopentyl nitrite, see	1113	3	
ISOBUTYLAMINE	1214	3		ISOPHORONEDIAMINE	2289	8	
ISOBUTYLENE	1055	2		ISOPHORONE DIISOCYANATE	2290	6.1	
ISOBUTYL FORMATE	2393	3		ISOPRENE, STABILIZED	1218	3	
ISOBUTYL ISOBUTYRATE	2528	3		ISOPROPANOL	1219	3	
ISOBUTYL ISOCYANATE	2486	3		ISOPROPENYL ACETATE	2403	3	
ISOBUTYL METHACRYLATE, STABILIZED	2283	3		ISOPROPENYLBENZENE	2303	3	
ISOBUTYL PROPIONATE	2394	3		ISOPROPYL ACETATE	1220	3	
ISOBUTYRALDEHYDE	2045	3		ISOPROPYL ACID PHOSPHATE	1793	8	
ISOBUTYRIC ACID	2529	3		ISOPROPYL ALCOHOL, see	1219	3	
ISOBUTYRONITRILE	2284	3		ISOPROPYLAMINE	1221	3	
ISOBUTYRYL CHLORIDE	2395	3		ISOPROPYLBENZENE	1918	3	
ISOCYANATES, FLAMMABLE, TOXIC, N.O.S.	2478	3		ISOPROPYL BUTYRATE	2405	3	
ISOCYANATES, TOXIC, N.O.S.	2206	6.1		Isopropyl chloride, see	2356	3	
ISOCYANATES, TOXIC, FLAMMABLE, N.O.S.	3080	6.1		ISOPROPYL CHLOROACETATE	2947	3	
ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S.	2478	3		ISOPROPYL CHLOROFORMATE	2407	6.1	
ISOCYANATE SOLUTION, TOXIC, N.O.S.	2206	6.1		ISOPROPYL 2-CHLORO-PROPIONATE	2934	3	
ISOCYANATE SOLUTION, TOXIC, FLAMMABLE, N.O.S.	3080	6.1		Isopropyl-alpha-chloropropionate, see	2934	3	
ISOCYANATO-BENZOTRIFLUORIDES	2285	6.1		Isopropyl ether, see	1159	3	
3-Isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate, see	2290	6.1		Isopropylethylene, see	2561	3	
				Isopropyl formate, see	1281	3	
				ISOPROPYL ISOBUTYRATE	2406	3	
				ISOPROPYL ISOCYANATE	2483	3	
				Isopropyl mercaptan, see	2402	3	

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ISOPROPYL NITRATE	1222	3		LEAD CYANIDE	1620	6.1	
ISOPROPYL PROPIONATE	2409	3		Lead (II) cyanide	1620	6.1	
Isolpropyltoluene, see	2046	3		LEAD DIOXIDE	1872	5.1	
Isopropyltoluol, see	2046	3		LEAD NITRATE	1469	5.1	
ISOSORBIDE DINITRATE MIXTURE with not less than 60% lactose, mannose, starch or calcium hydrogen phosphate	2907	4.1		Lead (II) nitrate	1469	5.1	
ISOSORBIDE-5-MONONITRATE	3251	4.1		LEAD PERCHLORATE, SOLID	1470	5.1	
Isovaleraldehyde, see	2058	3		LEAD PERCHLORATE, SOLUTION	3408	5.1	
JET PERFORATING GUNS, CHARGED, oil well, without detonator	0124 0494	1 1		Lead (II) perchlorate	1470 3408	5.1 5.1	
Jet tappers, without detonator, see	0059	1		Lead peroxide, see	1872	5.1	
KEROSENE	1223	3		LEAD PHOSPHITE, DIBASIC	2989	4.1	
KETONES, LIQUID, N.O.S.	1224	3		LEAD STYPHNATE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	0130	1	
KRYPTON, COMPRESSED	1056	2		LEAD SULPHATE with more than 3% free acid	1794	8	
KRYPTON, REFRIGERATED LIQUID	1970	2		Lead tetraethyl, see	1649	6.1	
Lacquer, see	1263 3066 3469 3470	3 8 3 8		Lead tetramethyl, see	1649	6.1	
Lacquer base, liquid, see	1263 3066 3469 3470	3 8 3 8		LEAD TRINITRORESORCINATE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass, see	0130	1	
Lacquer base or lacquer chips, nitrocellulose, dry, see	2557	4.1		LIFE-SAVING APPLIANCES NOT SELF-INFLATING containing dangerous goods as equipment	3072	9	
Lacquer base or lacquer chips, plastic, wet with alcohol or solvent, see	1263 2059 2555 2556	3 3 4.1 4.1		LIFE-SAVING APPLIANCES, SELF-INFLATING	2990	9	
LEAD ACETATE	1616	6.1		LIGHTER REFILLS containing flammable gas	1057	2	
Lead (II) acetate, see	1616	6.1		LIGHTERS containing flammable gas	1057	2	
LEAD ARSENATES	1617	6.1		LIGHTERS, FUSE	0131	1	
LEAD ARSENITES	1618	6.1		Limonene, inactive, see	2052	3	
LEAD AZIDE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	0129	1		LIQUEFIED GAS, N.O.S.	3163	2	
Lead chloride, solid, see	2291	6.1		LIQUEFIED GAS, FLAMMABLE, N.O.S.	3161	2	
LEAD COMPOUND, SOLUBLE, N.O.S.	2291	6.1		LIQUEFIED GASES, non- flammable, charged with nitrogen, carbon dioxide or air	1058	2	

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LIQUEFIED GAS, OXIDIZING, N.O.S.	3157	2		LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT (including lithium alloy batteries)	3091	9	
LIQUEFIED GAS, TOXIC, N.O.S.	3162	2		LITHIUM BOROXYDRIDE	1413	4.3	
LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.	3308	2		LITHIUM FERROSILICON	2830	4.3	
LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.	3160	2		LITHIUM HYDRIDE	1414	4.3	
LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	3309	2		LITHIUM HYDRIDE, FUSED SOLID	2805	4.3	
LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.	3307	2		LITHIUM HYDROXIDE	2680	8	
LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.	3307	2		LITHIUM HYDROXIDE SOLUTION	2679	8	
LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	3310	2		LITHIUM HYPOCHLORITE, DRY	1471	5.1	
Liquefied petroleum gas, see	1075	2		LITHIUM HYPOCHLORITE MIXTURE	1471	5.1	
Liquid filler, see	1263 3066 3469 3470	3 8 3 8		Lithium in cartouches, see	1415	4.3	
Liquid lacquer base, see	1263 3066 3469 3470	3 8 3 8		LITHIUM NITRATE	2722	5.1	
LITHIUM	1415	4.3		LITHIUM NITRIDE	2806	4.3	
Lithium alkyls, liquid, see	3394	4.2		LITHIUM PEROXIDE	1472	5.1	
Lithium alkyls, solid, see	3393	4.2		Lithium silicide, see	1417	4.3	
LITHIUM ALUMINIUM HYDRIDE	1410	4.3		LITHIUM SILICON	1417	4.3	
LITHIUM ALUMINIUM HYDRIDE, ETHEREAL	1411	4.3		L.n.g., see	1972	2	
LITHIUM ION BATTERIES (including lithium ion polymer batteries)	3480	9		LONDON PURPLE	1621	6.1	
LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT (including lithium ion polymer batteries)	3481	9		L.p.g., see	1075	2	
LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)	3481	9		Lye, see	1823	8	
LITHIUM METAL BATTERIES (including lithium alloy batteries)	3090	9		Lythene, see	1268	3	
LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT (including lithium alloy batteries)	3091	9		MAGNESIUM in pellets, turnings or ribbons	1869	4.1	
				Magnesium alkyls, see	3394	4.2	
				MAGNESIUM ALLOYS with more than 50% magnesium in pellets, turnings or ribbons	1869	4.1	
				MAGNESIUM ALLOYS POWDER	1418	4.3	
				MAGNESIUM ALUMINIUM PHOSPHIDE	1419	4.3	
				MAGNESIUM ARSENATE	1622	6.1	
				Magnesium bisulphite solution, see	2693	8	
				MAGNESIUM BROMATE	1473	5.1	

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MAGNESIUM CHLORATE	2723	5.1		Manganese (II) nitrate, see	2724	5.1	
Magnesium chloride and chlorate mixture, see	1459 3407	5.1 5.1		MANGANESE RESINATE	1330	4.1	
MAGNESIUM DIAMIDE	2004	4.2		Manganous nitrate, see	2724	5.1	
Magnesium diphenyl, see	3393	4.2		MANNITOL HEXANITRATE, WETTED with not less than 40% water, or mixture of alcohol and water, by mass	0133	1	
MAGNESIUM FLUOROSILICATE	2853	6.1		MATCHES, FUSEE	2254	4.1	
MAGNESIUM GRANULES, COATED, particle size not less than 149 microns	2950	4.3		MATCHES, SAFETY (book, card or strike on box)	1944	4.1	
MAGNESIUM HYDRIDE	2010	4.3		MATCHES, "STRIKE ANYWHERE"	1331	4.1	
MAGNESIUM NITRATE	1474	5.1		MATCHES, WAX "VESTA"	1945	4.1	
MAGNESIUM PERCHLORATE	1475	5.1		MEDICAL WASTE, N.O.S.	3291	6.2	
MAGNESIUM PEROXIDE	1476	5.1		MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S.	3248	3	
MAGNESIUM PHOSPHIDE	2011	4.3		MEDICINE, LIQUID, TOXIC, N.O.S.	1851	6.1	
MAGNESIUM POWDER	1418	4.3		MEDICINE, SOLID, TOXIC, N.O.S.	3249	6.1	
Magnesium scrap, see	1869	4.1		p-Mentha-1,8-diene, see	2052	8	
MAGNESIUM SILICIDE	2624	4.3		MERCAPTANS, LIQUID, FLAMMABLE, N.O.S.	3336	3	
Magnesium silicofluoride, see	2853	6.1		MERCAPTANS, LIQUID, FLAMMABLE, TOXIC, N.O.S.	1228	3	
Magnetized material	2807	9	Not subject to ADN	MERCAPTANS, LIQUID, TOXIC, FLAMMABLE, N.O.S.	3071	6.1	
MALEIC ANHYDRIDE	2215	8		MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.	3336	3	
MALEIC ANHYDRIDE, MOLTEN	2215	8		MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, TOXIC, N.O.S.	1228	3	
Malonic dinitrile, see	2647	6.1		MANEB	2210	4.2	
Malonodinitrile, see	2647	6.1		MANEB PREPARATION with not less than 60% maneb	2210	4.2	
MALONONITRILE	2647	6.1		MANEB PREPARATION, STABILIZED against self-heating	2968	4.3	
MANEB	2210	4.2		MANEB, STABILIZED against self-heating	2968	4.3	
MANEB PREPARATION with not less than 60% maneb	2210	4.2		Manganese ethylene-dithiocarbamate, see	2210	4.2	
MANEB PREPARATION, STABILIZED against self-heating	2968	4.3		Manganese ethylene-1,2-dithiocarbamate, see	2210	4.2	
MANEB, STABILIZED against self-heating	2968	4.3		MANGANESE NITRATE	2724	5.1	
Manganese ethylene-dithiocarbamate, see	2210	4.2					
Manganese ethylene-1,2-dithiocarbamate, see	2210	4.2					
MANGANESE NITRATE	2724	5.1					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
MERCURIC POTASSIUM CYANIDE	1626	6.1		MERCURY POTASSIUM IODIDE	1643	6.1	
Mercuric sulphate, see	1645	6.1		MERCURY SALICYLATE	1644	6.1	
Mercuriol, see	1639	6.1		MERCURY SULPHATE	1645	6.1	
Mercurous bisulphate, see	1645	6.1		MERCURY THIOCYANATE	1646	6.1	
MERCUROUS NITRATE	1627	6.1		Metal alkyl halides, water-reactive, n.o.s. / Metal aryl halides, water-reactive, n.o.s., see	3394	4.2	
Mercurous sulphate, see	1645	6.1		Metal alkyl hydrides, water-reactive, n.o.s. / Metal aryl hydrides, water-reactive, n.o.s., see	3394	4.2	
MERCURY	2809	8		Metal alkyls, water-reactive, n.o.s. / Metal aryls, water-reactive, n.o.s., see	3393	4.2	
MERCURY ACETATE	1629	6.1		Mesitylene, see	2325	3	
MERCURY AMMONIUM CHLORIDE	1630	6.1		MESITYL OXIDE	1229	3	
MERCURY BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2778	3		METAL CARBONYLS, LIQUID, N.O.S.	3281	6.1	
MERCURY BASED PESTICIDE, LIQUID, TOXIC	3012	6.1		METAL CARBONYLS, SOLID, N.O.S.	3466	6.1	
MERCURY BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3011	6.1		METAL CATALYST, DRY	2881	4.2	
MERCURY BASED PESTICIDE, SOLID, TOXIC	2777	6.1		METAL CATALYST, WETTED with a visible excess of liquid	1378	4.2	
MERCURY BENZOATE	1631	6.1		METALDEHYDE	1332	4.1	
Mercury bichloride, see	1624	6.1		METAL HYDRIDES, FLAMMABLE, N.O.S.	3182	4.1	
MERCURY BROMIDES	1634	6.1		METAL HYDRIDES, WATER-REACTIVE, N.O.S.	1409	4.3	
MERCURY COMPOUND, LIQUID, N.O.S.	2024	6.1		METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.	3208	4.3	
MERCURY COMPOUND, SOLID, N.O.S.	2025	6.1		METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.	3209	4.3	
MERCURY CYANIDE	1636	6.1		METAL POWDER, FLAMMABLE, N.O.S.	3089	4.1	
MERCURY FULMINATE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	0135	1		METAL POWDER, SELF-HEATING, N.O.S.	3189	4.2	
MERCURY GLUCONATE	1637	6.1		METAL SALTS OF ORGANIC COMPOUNDS, FLAMMABLE, N.O.S.	3181	4.1	
MERCURY IODIDE	1638	6.1		METHACRYLALDEHYDE, STABILIZED	2396	3	
MERCURY NUCLEATE	1639	6.1		METHACRYLIC ACID, STABILIZED	2531	8	
MERCURY OLEATE	1640	6.1		METHACRYLONITRILE, STABILIZED	3079	3	
MERCURY OXIDE	1641	6.1					
MERCURY OXYCYANIDE, DESENSITIZED	1642	6.1					

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METHALLYL ALCOHOL	2614	3		Methyl amyl ketone, see	1110	3	
Methanal, see	1198 2209	3 8		N-METHYLANILINE	2294	6.1	
Methane and hydrogen mixture, see	2034	2		Methylated spirit, see	1986 1987	3 3	
METHANE, COMPRESSED	1971	2		alpha-METHYLBENZYL ALCOHOL, LIQUID	2937	6.1	
METHANE, REFRIGERATED LIQUID	1972	2		alpha-METHYLBENZYL ALCOHOL, SOLID	3438	6.1	
METHANESULPHONYL CHLORIDE	3246	6.1		METHYL BROMIDE with not more than 2% chloropicrin	1062	2	
METHANOL	1230	3		Methyl bromide and chloropicrin mixture, with more than 2% chloropicrin, see	1581	2	
2-Methoxyethyl acetate, see	1189	3		METHYL BROMIDE AND ETHYLENE DIBROMIDE MIXTURE, LIQUID	1647	6.1	
METHOXYMETHYL ISOCYANATE	2605	3		METHYL BROMOACETATE	2643	6.1	
4-METHOXY-4-METHYLPENTAN-2-ONE	2293	3		2-METHYLBUTANAL	3371	3	
1-Methoxy-2-nitrobenzene, see	2730 3458	6.1 6.1		3-METHYLBUTAN-2-ONE	2397	3	
1-Methoxy-3-nitrobenzene, see	2730 3458	6.1 6.1		2-METHYL-1-BUTENE	2459	3	
1-Methoxy-4-nitrobenzene, see	2730 3458	6.1 6.1		2-METHYL-2-BUTENE	2460	3	
1-METHOXY-2-PROPANOL	3092	3		3-METHYL-1-BUTENE	2561	3	
METHYL ACETATE	1231	3		N-METHYLBUTYLAMINE	2945	3	
METHYLACETYLENE AND PROPADIENE MIXTURE, STABILIZED such as mixture P1 or mixture P2	1060	2		METHYL tert-BUTYL ETHER	2398	3	
beta-Methyl acrolein, see	1143	6.1		METHYL BUTYRATE	1237	3	
METHYL ACRYLATE, STABILIZED	1919	3		METHYL CHLORIDE	1063	2	
METHYLAL	1234	3		Methyl chloride and chloropicrin mixture, see	1582	2	
Methyl alcohol, see	1230	3		METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	1912	2	
Methyl allyl alcohol, see	2614	3		METHYL CHLOROACETATE	2295	6.1	
METHYLALLYL CHLORIDE	2554	3		Methyl chlorocarbonate, see	1238	6.1	
METHYLAMINE, ANHYDROUS	1061	2		Methyl chloroform, see	2831	6.1	
METHYLAMINE, AQUEOUS SOLUTION	1235	3		METHYL CHLOROFORMATE	1238	6.1	
METHYLAMYL ACETATE	1233	3		METHYL CHLOROMETHYL ETHER	1239	6.1	
Methyl amyl alcohol, see	2053	3		METHYL 2-CHLORO-PROPIONATE	2933	3	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
Methyl alpha-chloropropionate, see	2933	3		METHYL ISOPROPENYL KETONE, STABILIZED	1246	3	
METHYLCHLOROSILANE	2534	2		METHYL ISOTHIOCYANATE	2477	6.1	
Methyl cyanide, see	1648	3		METHYL ISOVALERATE	2400	3	
METHYLCYCLOHEXANE	2296	3		METHYL MAGNESIUM BROMIDE IN ETHYL ETHER	1928	4.3	
METHYLCYCLOHEXANOLS, flammable	2617	3		METHYL MERCAPTAN	1064	2	
METHYLCYCLOHEXANONE	2297	3		Methyl mercaptopropionaldehyde, see	2785	6.1	
METHYLCYCLOPENTANE	2298	3		METHYL METHACRYLATE MONOMER, STABILIZED	1247	3	
METHYL DICHLOROACETATE	2299	6.1		4-METHYLMORPHOLINE	2535	3	
METHYLDICHLOROSILANE	1242	4.3		N-METHYLMORPHOLINE, see	2535	3	
Methylene bromide, see	2664	6.1		METHYL NITRITE	2455	2	Carriage prohibited
Methylene chloride, see	1593	6.1		METHYL ORTHOSILICATE	2606	6.1	
Methylene chloride and methyl chloride mixture, see	1912	2		METHYLPENTADIENE	2461	3	
Methylene cyanide, see	2647	6.1		Methylpentanes, see	1208	3	
p,p'-Methylene dianiline, see	2651	6.1		2-METHYLPENTAN-2-OL	2560	3	
Methylene dibromide, see	2664	6.1		4-Methylpentan-2-ol, see	2053	3	
2,2'-Methylene-di-(3,4,6-trichlorophenol), see	2875	6.1		3-Methyl-2-penten-4ynol, see	2705	8	
Methyl ethyl ether, see	1039	2		METHYLPHENYL-DICHLOROSILANE	2437	8	
METHYL ETHYL KETONE, see	1193	3		2-Methyl-2-phenylpropane, see	2709	3	
2-METHYL-5-ETHYLPYRIDINE	2300	6.1		1-METHYLPYPERIDINE	2399	3	
METHYL FLUORIDE	2454	2		METHYL PROPIONATE	1248	3	
METHYL FORMATE	1243	3		Methylpropylbenzene, see	2046	3	
2-METHYLFURAN	2301	3		METHYL PROPYL ETHER	2612	3	
Methyl glycol, see	1188	3		METHYL PROPYL KETONE	1249	3	
Methyl glycol acetate, see	1189	3		Methyl pyridines, see	2313	3	
2-METHYL-2-HEPTANETHIOL	3023	6.1		Methylstyrene, inhibited, see	2618	3	
5-METHYLHEXAN-2-ONE	2302	3		alpha-Methylstyrene, see	2303	3	
METHYLHYDRAZINE	1244	6.1		Methyl sulphate, see	1595	6.1	
METHYL IODIDE	2644	6.1		Methyl sulphide, see	1164	3	
METHYL ISOBUTYL CARBINOL	2053	3		METHYLTETRAHYDROFURAN	2536	3	
METHYL ISOBUTYL KETONE	1245	3					
METHYL ISOCYANATE	2480	6.1					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
METHYL TRICHLOROACETATE	2533	6.1		Monochloropentafluoroethane and monochloro-difluoromethane mixture, see	1973	2	
METHYLTRICHLOROSILANE	1250	3					
alpha-METHYLVALERAL-DEHYDE	2367	3		Monoethylamine, see	1036	2	
Methyl vinyl benzene, inhibited, see	2618	3		MONONITROTOLUIDINES, see	2660	6.1	
METHYL VINYL KETONE, STABILIZED	1251	6.1		Monopropylamine, see	1277	3	
M.i.b.c., see	2053	3		MORPHOLINE	2054	8	
MINES with bursting charge	0136	1		MOTOR FUEL ANTI-KNOCK MIXTURE	1649	6.1	
	0137	1		MOTOR SPIRIT	1203	3	
	0138	1		Motor spirit and ethanol mixture, with more than 10% ethanol, see	3475	3	
	0294	1					
Mirbane oil, see	1662	6.1		Muriatic acid, see	1789	8	
Missiles, guided, see	0180	1		MUSK XYLENE, see	2956	4.1	
	0181	1					
	0182	1		Mysorite, see	2212	9	
	0183	1					
	0295	1		Naphta, see	1268	3	
	0397	1					
	0398	1		Naphta, petroleum, see	1268	3	
	0436	1					
	0437	1		Naphta, solvent, see	1268	3	
	0438	1					
Mixtures A, A01, A02, A0, A1, B1, B2, B or C, see	1965	2		NAPHTHALENE, CRUDE	1334	4.1	
				NAPHTHALENE, MOLTEN	2304	4.1	
Mixture F1, mixture F2 or mixture F3, see	1078	2		NAPHTHALENE, REFINED	1334	4.1	
MIXTURES OF 1,3-BUTADIENE AND HYDROCARBONS, STABILIZED, having a vapour pressure at 70 °C not exceeding 1.1 MPa (11 bar) and a density at 50 °C not lower than 0.525 kg/l	1010	2		alpha-NAPHTHYLAMINE	2077	6.1	
				beta-NAPHTHYLAMINE, SOLID	1650	6.1	
				beta-NAPHTHYLAMINE, SOLUTION	3411	6.1	
Mixture P1 or mixture P2, see	1060	2		NAPHTHYLTHIOUREA	1651	6.1	
				1-Naphthylthiourea, see	1651	6.1	
MOLYBDENUM PENTACHLORIDE	2508	8		NAPHTHYLUREA	1652	6.1	
Monochloroacetic acid, see	1750	6.1		NATURAL GAS, COMPRESSED with high methane content	1971	2	
	1751	6.1					
Monochlorobenzene, see	1134	3		NATURAL GAS, REFRIGERATED LIQUID with high methane content	1972	2	
Monochlorodifluoromethane, see	1018	2		Natural gasoline, see	1203	3	
Monochlorodifluoromethane and monochloro-pentafluoroethane mixture, see	1973	2		Neohexane, see	1208	3	
Monochlorodifluoromono-bromomethane, see	1974	2		NEON, COMPRESSED	1065	2	
				NEON, REFRIGERATED LIQUID	1913	2	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
Neothyl, see	2612	3		NITRATING ACID MIXTURE, SPENT, with more than 50% nitric acid	1826	8	
NICKEL CARBONYL	1259	6.1					
NICKEL CYANIDE	1653	6.1		NITRATING ACID MIXTURE, SPENT, with not more than 50% nitric acid	1826	8	
Nickel (II) cyanide, see	1653	6.1					
NICKEL NITRATE	2725	5.1		NITRIC ACID, other than red fuming, with at least 65% but not more than 70% nitric acid	2031	8	
Nickel (II) nitrate, see	2725	5.1					
NICKEL NITRITE	2726	5.1		NITRIC ACID, other than red fuming, with less than 65% nitric acid	2031	8	
Nickel (II) nitrite, see	2726	5.1					
Nickelous nitrate, see	2725	5.1		NITRIC ACID, other than red fuming, with more than 70% nitric acid	2031	8	
Nickelous nitrite, see	2726	5.1					
Nickel tetracarbonyl, see	1259	6.1		NITRIC ACID, RED FUMING	2032	8	
NICOTINE	1654	6.1		NITRIC OXIDE, COMPRESSED	1660	2	
NICOTINE COMPOUND, LIQUID, N.O.S	3144	6.1		NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURE	1975	2	
NICOTINE COMPOUND, SOLID, N.O.S	1655	6.1		NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURE, see	1975	2	
NICOTINE HYDROCHLORIDE, LIQUID	1656	6.1		NITRILES, FLAMMABLE, TOXIC, N.O.S.	3273	3	
NICOTINE HYDROCHLORIDE, SOLID	3444	6.1		NITRILES, TOXIC, LIQUID, N.O.S.	3276	6.1	
NICOTINE HYDROCHLORIDE SOLUTION	1656	6.1		NITRILES, TOXIC, SOLID, N.O.S.	3439	6.1	
NICOTINE PREPARATION, LIQUID, N.O.S.	3144	6.1		NITRILES, TOXIC, FLAMMABLE, N.O.S.	3275	6.1	
NICOTINE PREPARATION, SOLID, N.O.S.	1655	6.1		NITRITES, INORGANIC, N.O.S.	2627	5.1	
NICOTINE SALICYLATE	1657	6.1		NITRITES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	3219	5.1	
NICOTINE SULPHATE, SOLID	3445	6.1		NITROANILINES (o-, m-, p-)	1661	6.1	
NICOTINE SULPHATE, SOLUTION	1658	6.1		NITROANISOLES, LIQUID	2730	6.1	
NICOTINE TARTRATE	1659	6.1		NITROANISOLES, SOLID	3458	6.1	
NITRATES, INORGANIC, N.O.S.	1477	5.1		NITROBENZENE	1662	6.1	
NITRATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	3218	5.1		Nitrobenzene bromide, see	2732	6.1	
NITRATING ACID MIXTURE with more than 50% nitric acid	1796	8		NITROBENZENESULPHONIC ACID	2305	8	
NITRATING ACID MIXTURE with not more than 50% nitric acid	1796	8		Nitrobenzol, see	1662	6.1	
				5-NITROBENZOTRIAZOL	0385	1	

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NITROBENZOTRIFLUORIDES, LIQUID	2306	6.1		NITROCELLULOSE WITH WATER (not less than 25% water, by mass)	2555	4.1	
NITROBENZOTRIFLUORIDES, SOLID	3431	6.1		Nitrochlorobenzenes, see	1578 3409	6.1 6.1	
NITROBROMOBENZENES, LIQUID	2732	6.1		3-NITRO-4-CHLOROBENZO-TRIFLUORIDE	2307	6.1	
NITROBROMOBENZENES, SOLID	3459	6.1		NITROCRESOLS, LIQUID	3434	6.1	
NITROCELLULOSE, dry or wetted with less than 25% water (or alcohol), by mass	0340	1		NITROCRESOLS, SOLID	2446	6.1	
NITROCELLULOSE, unmodified or plasticized with less than 18% plasticizing substance, by mass	0341	1		NITROETHANE	2842	3	
NITROCELLULOSE MEMBRANE FILTERS, with not more than 12.6% nitrogen, by dry mass	3270	4.1		NITROGEN, COMPRESSED	1066	2	
NITROCELLULOSE, with not more than 12.6% nitrogen, by dry mass, MIXTURE WITH PLASTICIZER, WITH PIGMENT	2557	4.1		NITROGEN DIOXIDE, see	1067	2	
NITROCELLULOSE, with not more than 12.6% nitrogen, by dry mass, MIXTURE WITH PLASTICIZER, WITHOUT PIGMENT	2557	4.1		NITROGEN, REFRIGERATED LIQUID	1977	2	
NITROCELLULOSE, with not more than 12.6% nitrogen, by dry mass, MIXTURE WITHOUT PLASTICIZER, WITH PIGMENT	2557	4.1		NITROGEN TRIFLUORIDE	2451	2	
NITROCELLULOSE, with not more than 12.6% nitrogen, by dry mass, MIXTURE WITHOUT PLASTICIZER, WITHOUT PIGMENT	2557	4.1		NITROGEN TRIOXIDE	2421	2	Carriage prohibited
NITROCELLULOSE, PLASTICIZED with not less than 18% plasticizing substance, by mass	0343	1		NITROGLYCERIN, DESENSITIZED with not less than 40% non-volatile water-insoluble phlegmatizer, by mass	0143	1	
NITROCELLULOSE SOLUTION, FLAMMABLE with not more than 12.6% nitrogen, by dry mass, and not more than 55% nitrocellulose	2059	3		NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, N.O.S. with not more than 30% nitroglycerin, by mass	3357	3	
NITROCELLULOSE, WETTED with not less than 25% alcohol, by mass	0342	1		NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, FLAMMABLE, N.O.S. with not more than 30% nitroglycerin, by mass	3343	3	
NITROCELLULOSE WITH ALCOHOL (not less than 25% alcohol, by mass, and not more than 12.6% nitrogen, by dry mass)	2556	4.1		NITROGLYCERIN MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 2% but not more than 10% nitroglycerin, by mass	3319	4.1	
				NITROGLYCERIN, SOLUTION IN ALCOHOL with more than 1% but not more than 5% nitroglycerin	3064	3	
				NITROGLYCERIN SOLUTION IN ALCOHOL with more than 1% but not more than 10% nitroglycerin	0144	1	
				NITROGLYCERIN SOLUTION IN ALCOHOL with not more than 1% nitroglycerin	1204	3	
				NITROGUANIDINE, dry or wetted with less than 20% water, by mass	0282	1	

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NITROGUANIDINE, WETTED with not less than 20% water, by mass	1336	4.1		NONYLTRICHLOROSILANE	1799	8	
NITROHYDROCHLORIC ACID	1798	8	Carriage prohibited	2,5-NORBORNADIENE, STABILIZED, see	2251	3	
				Normal propyl alcohol, see	1274	3	
NITROMANNITE, WETTED, see	0133	1		NTO, see	0490	1	
NITROMETHANE	1261	3		OCTADECYLTRICHLOROSILANE	1800	8	
Nitromuriatic acid, see	1798	8		OCTADIENE	2309	3	
NITRONAPHTHALENE	2538	4.1		OCTAFLUOROBUT-2-ENE	2422	2	
NITROPHENOLS (o-, m-, p-)	1663	6.1		OCTAFLUOROCYCLOBUTANE	1976	2	
4-NITROPHENYLHYDRAZINE, with not less than 30% water, by mass	3376	4.1		OCTAFLUOROPROPANE	2424	2	
NITROPROPANES	2608	3		OCTANES	1262	3	
p-NITROSODIMETHYLANILINE	1369	4.2		OCTOGEN, see	0226 0391 0484	1 1 1	
NITROSTARCH, dry or wetted with less than 20% water, by mass	0146	1		OCTOL, dry or wetted with less than 15% water, by mass, see	0266	1	
NITROSTARCH, WETTED with not less than 20% water, by mass	1337	4.1		OCTOLITE, dry or wetted with less than 15% water, by mass	0266	1	
NITROSYL CHLORIDE	1069	2		OCTONAL	0496	1	
NITROSYLSULPHURIC ACID, LIQUID	2308	8		OCTYL ALDEHYDES	1191	3	
NITROSYLSULPHURIC ACID, SOLID	3456	8		tert-Octyl mercaptan, see	3023	6.1	
NITROTOLUENES, LIQUID	1664	6.1		OCTYLTRICHLOROSILANE	1801	8	
NITROTOLUENES, SOLID	3446	6.1		Oenanthol, see	3056	3	
NITROTOLUIDINES	2660	6.1		OIL GAS, COMPRESSED	1071	2	
NITROTRIAZOLONE	0490	1		Oleum, see	1831	8	
NITRO UREA	0147	1		ORGANIC PEROXIDE TYPE B, LIQUID	3101	5.2	
NITROUS OXIDE	1070	2		ORGANIC PEROXIDE TYPE B, LIQUID, TEMPERATURE CONTROLLED	3111	5.2	
NITROUS OXIDE, REFRIGERATED LIQUID	2201	2		ORGANIC PEROXIDE TYPE B, SOLID	3102	5.2	
NITROXYLENES, LIQUID	1665	6.1		ORGANIC PEROXIDE TYPE B, SOLID, TEMPERATURE CONTROLLED	3112	5.2	
NITROXYLENES, SOLID	3447	6.1					
Non-activated carbon, see	1361	4.2		ORGANIC PEROXIDE TYPE C, LIQUID	3103	5.2	
Non-activated charcoal, see	1361	4.2					
NONANES	1920	3					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED	3113	5.2		ORGANOCHLORINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2762	3	
ORGANIC PEROXIDE TYPE C, SOLID	3104	5.2		ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC	2996	6.1	
ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED	3114	5.2		ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	2995	6.1	
ORGANIC PEROXIDE TYPE D, LIQUID	3105	5.2		ORGANOCHLORINE PESTICIDE, SOLID, TOXIC	2761	6.1	
ORGANIC PEROXIDE TYPE D, LIQUID, TEMPERATURE CONTROLLED	3115	5.2		ORGANOMETALLIC COMPOUND, TOXIC, LIQUID, N.O.S.	3282	6.1	
ORGANIC PEROXIDE TYPE D, SOLID	3106	5.2		ORGANOMETALLIC COMPOUND, TOXIC, SOLID, N.O.S.	3467	6.1	
ORGANIC PEROXIDE TYPE D, SOLID, TEMPERATURE CONTROLLED	3116	5.2		Organometallic compound, solid, water-reactive, flammable, n.o.s., see	3396	4.3	
ORGANIC PEROXIDE TYPE E, LIQUID	3107	5.2		Organometallic compound or Organometallic compound solution or Organometallic compound dispersion, water-reactive, flammable, n.o.s., see	3399	4.3	
ORGANIC PEROXIDE TYPE E, LIQUID, TEMPERATURE CONTROLLED	3117	5.2		ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC	3392	4.2	
ORGANIC PEROXIDE TYPE E, SOLID	3108	5.2		ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC	3391	4.2	
ORGANIC PEROXIDE TYPE E, SOLID, TEMPERATURE CONTROLLED	3118	5.2		ORGANOMETALLIC SUBSTANCE, SOLID, SELF- HEATING	3400	4.2	
ORGANIC PEROXIDE TYPE F, LIQUID	3109	5.2		ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER- REACTIVE	3394	4.2	
ORGANIC PEROXIDE TYPE F, LIQUID, TEMPERATURE CONTROLLED	3119	5.2		ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC, WATER- REACTIVE	3393	4.2	
ORGANIC PEROXIDE TYPE F, SOLID	3110	5.2		ORGANOMETALLIC SUBSTANCE, LIQUID, WATER- REACTIVE	3398	4.3	
ORGANIC PEROXIDE TYPE F, SOLID, TEMPERATURE CONTROLLED	3120	5.2		ORGANOMETALLIC SUBSTANCE, SOLID, WATER- REACTIVE	3395	4.3	
Organic peroxides, see 2.2.52.4 for an alphabetic list of currently assigned organic peroxides and see	3101 to 3120	5.2		ORGANOMETALLIC SUBSTANCE, SOLID, WATER- REACTIVE	3399	4.3	
ORGANIC PIGMENTS, SELF- HEATING	3313	4.2		ORGANOMETALLIC SUBSTANCE, LIQUID, WATER- REACTIVE	3399	4.3	
ORGANOARSENIC COMPOUND, LIQUID, N.O.S.	3280	6.1		ORGANOMETALLIC SUBSTANCE, LIQUID, WATER- REACTIVE, FLAMMABLE			
ORGANOARSENIC COMPOUND, SOLID, N.O.S.	3465	6.1					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, FLAMMABLE	3396	4.3		OXIDIZING LIQUID, TOXIC, N.O.S.	3099	5.1	
ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, SELF-HEATING	3397	4.3		OXIDIZING SOLID, N.O.S.	1479	5.1	
ORGANOPHOSPHORUS COMPOUND, TOXIC, LIQUID, N.O.S.	3278	6.1		OXIDIZING SOLID, CORROSIVE, N.O.S.	3085	5.1	
ORGANOPHOSPHORUS COMPOUND, TOXIC, SOLID, N.O.S.	3464	6.1		OXIDIZING SOLID, FLAMMABLE, N.O.S.	3137	5.1	Carriage prohibited
ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE, N.O.S.	3279	6.1		OXIDIZING SOLID, SELF-HEATING, N.O.S.	3100	5.1	Carriage prohibited
ORGANOPHOSPHORUS PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2784	3		OXIDIZING SOLID, TOXIC, N.O.S.	3087	5.1	
ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC	3018	6.1		OXIDIZING SOLID, WATER-REACTIVE, N.O.S.	3121	5.1	Carriage prohibited
ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3017	6.1		Oxirane, see	1040	2	
ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC	2783	6.1		OXYGEN, COMPRESSED	1072	2	
ORGANOTIN COMPOUND, LIQUID, N.O.S.	2788	6.1		OXYGEN DIFLUORIDE, COMPRESSED	2190	2	
ORGANOTIN COMPOUND, SOLID, N.O.S.	3146	6.1		OXYGEN GENERATOR, CHEMICAL	3356	5.1	
ORGANOTIN PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2787	3		OXYGEN, REFRIGERATED LIQUID	1073	2	
ORGANOTIN PESTICIDE, LIQUID, TOXIC	3020	6.1		1-Oxy-4-nitrobenzene, see	1663	6.1	
ORGANOTIN PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3019	6.1		PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	1263 3066 3469 3470	3 8 3 8	
ORGANOTIN PESTICIDE, SOLID, TOXIC	2786	6.1		PAINT RELATED MATERIAL (including paint thinning and reducing compound)	1263 3066 3469 3470	3 8 3 8	
Orthophosphoric acid, see	1805	8		Paint thinning and reducing compound, see	1263 3066 3469 3470	3 8 3 8	
OSMIUM TETROXIDE	2471	6.1		PAPER, UNSATURATED OIL TREATED, incompletely dried (including carbon paper)	1379	4.2	
OXIDIZING LIQUID, N.O.S.	3139	5.1		Paraffin, see	1223	3	
OXIDIZING LIQUID, CORROSIVE, N.O.S.	3098	5.1		PARAFORMALDEHYDE	2213	4.1	
				PARALDEHYDE	1264	3	
				PCBs, see	2315 3432	9 9	
				PENTABORANE	1380	4.2	
				PENTACHLOROETHANE	1669	6.1	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
PENTACHLOROPHENOL	3155	6.1		PERCHLORIC ACID with more than 50% but not more than 72% acid, by mass	1873	5.1	
PENTAERYTHRITOL	0411	1		PERCHLORIC ACID with not more than 50% acid, by mass	1802	8	
TETRANITRATE with not less than 7% wax, by mass				Perchlorobenzene, see	2729	6.1	
PENTAERYTHRITOL	0150	1		Perchlorocyclopentadiene, see	2646	6.1	
TETRANITRATE, DESENSITIZED with not less than 15% phlegmatizer, by mass				Perchloroethylene, see	1897	6.1	
PENTAERYTHRITOL	3344	4.1		PERCHLOROMETHYL MERCAPTAN	1670	6.1	
TETRANITRATE MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 10% but not more than 20% PETN, by mass				PERCHLORYL FLUORIDE	3083	2	
PENTAERYTHRITOL	0150	1		Perfluoroacetylchloride, see	3057	2	
TETRANITRATE, WETTED with not less than 25% water, by mass				PERFLUORO(ETHYL VINYL ETHER)	3154	2	
PENTAERYTHRITOL	0150	1		PERFLUORO(METHYL VINYL ETHER)	3153	2	
TETRANITRATE, see	0411	1		Perfluoropropane, see	2424	2	
	3344	4.1		PERFUMERY PRODUCTS with flammable solvents	1266	3	
PENTAFLUOROETHANE	3220	2		PERMANGANATES, INORGANIC, N.O.S.	1482	5.1	
Pentafluoroethane, 1,1,1-trifluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 44% pentafluoroethane and 52% 1,1,1-trifluoroethane, see	3337	2		PERMANGANATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	3214	5.1	
PENTAMETHYLHEPTANE	2286	3		PEROXIDES, INORGANIC, N.O.S.	1483	5.1	
Pentanal, see	2058	3		PERSULPHATES, INORGANIC, N.O.S.	3215	5.1	
PENTANE-2,4-DIONE	2310	3		PERSULPHATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	3216	5.1	
PENTANES, liquid	1265	3		PESTICIDE, LIQUID, FLAMMABLE, TOXIC, N.O.S., flash-point less than 23 °C	3021	3	
n-Pentane, see	1265	3		PESTICIDE, LIQUID, TOXIC, N.O.S.	2902	6.1	
PENTANOLS	1105	3		PESTICIDE, LIQUID, TOXIC, FLAMMABLE, N.O.S., flash-point not less than 23 °C	2903	6.1	
n-Pentanol, see	1105	3		PENTOLITE, dry or wetted with less than 15% water, by mass	0151	1	
3-Pentanol, see	1105	3		Pentyl nitrite, see	1113	3	
1-PENTENE	1108	3		PERCHLORATES, INORGANIC, N.O.S.	1481	5.1	
1-PENTOL	2705	8		PERCHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	3211	5.1	
Pentyl nitrite, see	1113	3		Pesticide, toxic, under compressed gas, n.o.s, see	1950	2	

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PETN, see	0150	1		PHENYLACETONITRILE, LIQUID	2470	6.1	
	0411	1					
	3344	4.1		PHENYLACETYL CHLORIDE	2577	8	
PETN/TNT, see	0151	1		Phenylamine, see	1547	6.1	
PETROL	1203	3		1-Phenylbutane, see	2709	3	
Petrol and ethanol mixture, with more than 10% ethanol, see	3475	3		2-Phenylbutane, see	2709	3	
PETROLEUM CRUDE OIL	1267	3		PHENYLCARBYLAMINE CHLORIDE	1672	6.1	
PETROLEUM DISTILLATES, N.O.S.	1268	3		PHENYL CHLOROFORMATE	2746	6.1	
Petroleum ether, see	1268	3		Phenyl cyanide, see	2224	6.1	
PETROLEUM GASES, LIQUEFIED	1075	2		PHENYLENEDIAMINES (o-, m-, p-)	1673	6.1	
Petroleum naphtha, see	1268	3		Phenylethylene, see	2055	3	
Petroleum oil, see	1268	3		PHENYLHYDRAZINE	2572	6.1	
PETROLEUM PRODUCTS, N.O.S.	1268	3		PHENYL ISOCYANATE	2487	6.1	
Petroleum raffinate, see	1268	3		Phenylisocyanodichloride, see	1672	6.1	
Petroleum spirit, see	1268	3		PHENYL MERCAPTAN	2337	6.1	
PHENACYL BROMIDE	2645	6.1		PHENYLMERCURIC ACETATE	1674	6.1	
PHENETIDINES	2311	6.1		PHENYLMERCURIC COMPOUND, N.O.S.	2026	6.1	
PHENOLATES, LIQUID	2904	8		PHENYLMERCURIC HYDROXIDE	1894	6.1	
PHENOLATES, SOLID	2905	8		PHENYLMERCURIC NITRATE	1895	6.1	
PHENOL, MOLTEN	2312	6.1		PHENYLPHOSPHORUS DICHLORIDE	2798	8	
PHENOL, SOLID	1671	6.1		PHENYLPHOSPHORUS THIODICHLORIDE	2799	8	
PHENOL SOLUTION	2821	6.1		2-Phenylpropene, see	2303	3	
PHENOLSULPHONIC ACID, LIQUID	1803	8		PHENYLTRICHLOROSILANE	1804	8	
PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3346	3		PHOSGENE	1076	2	
PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC	3348	6.1		9-PHOSPHABICYCLONONANES	2940	4.2	
PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3347	6.1		PHOSPHINE	2199	2	
				Phosphoretted hydrogen, see	2199	2	
				PHOSPHORIC ACID, SOLUTION	1805	8	
				PHOSPHORIC ACID, SOLID	3453	8	
				Phosphoric acid, anhydrous, see	1807	8	
				PHOSPHOROUS ACID	2834	8	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
PHOSPHORUS, AMORPHOUS	1338	4.1		Phosphoryl chloride, see	1810	8	
Phosphorus bromide, see	1808	8		PHTHALIC ANHYDRIDE with more than 0.05% of maleic anhydride	2214	8	
Phosphorus chloride, see	1809	6.1		PICOLINES	2313	3	
PHOSPHORUS HEPTASULPHIDE, free from yellow and white phosphorus	1339	4.1		PICRAMIDE, see	0153	1	
PHOSPHORUS OXYBROMIDE	1939	8		PICRIC ACID WETTED, see	1344 3364	4.1 4.1	
PHOSPHORUS OXYBROMIDE, MOLTEN	2576	8		PICRITE, see	0282	1	
PHOSPHORUS OXYCHLORIDE	1810	8		PICRITE, WETTED, see	1336	4.1	
PHOSPHORUS PENTABROMIDE	2691	8		Picrotoxin, see	3172 3462	6.1 6.1	
PHOSPHORUS PENTACHLORIDE	1806	8		PICRYL CHLORIDE, see	0155	1	
PHOSPHORUS PENTAFLUORIDE	2198	2		PICRYL CHLORIDE, WETTED, see	3365	4.1	
PHOSPHORUS PENTASULPHIDE, free from yellow and white phosphorus	1340	4.3		alpha-PINENE	2368	3	
PHOSPHORUS PENTOXIDE	1807	8		PINE OIL	1272	3	
PHOSPHORUS SESQUISULPHIDE, free from yellow and white phosphorus	1341	4.1		PIPERAZINE	2579	8	
Phosphorus (V) sulphide, free from yellow and white phosphorus, see	1340	4.3		PIPERIDINE	2401	8	
Phosphorus sulphochloride, see	1837	8		Pivaloyl chloride, see	2438	6.1	
PHOSPHORUS TRIBROMIDE	1808	8		Plastic explosives , see	0084	1	
PHOSPHORUS TRICHLORIDE	1809	6.1		PLASTICS MOULDING COMPOUND in dough, sheet or extruded rope form evolving flammable vapour	3314	9	
PHOSPHORUS TRIOXIDE	2578	8		PLASTICS, NITROCELLULOSE-BASED, SELF-HEATING, N.O.S.	2006	4.2	
PHOSPHORUS TRISULPHIDE, free from yellow and white phosphorus	1343	4.1		Polish, see	1263 3066 3469 3470	3 8 3 8	
PHOSPHORUS, WHITE, DRY	1381	4.2		POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S.	2733	3	
PHOSPHORUS, WHITE IN SOLUTION	1381	4.2		POLYAMINES, LIQUID, CORROSIVE, N.O.S.	2735	8	
PHOSPHORUS, WHITE, MOLTEN	2447	4.2		POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.	2734	8	
PHOSPHORUS, WHITE, UNDER WATER	1381	4.2		POLYAMINES, SOLID, CORROSIVE, N.O.S.	3259	8	
PHOSPHORUS, YELLOW, DRY	1381	4.2		POLYCHLORINATED BIPHENYLS, LIQUID	2315	9	
PHOSPHORUS, YELLOW, IN SOLUTION	1381	4.2		POLYCHLORINATED BIPHENYLS, SOLID	3432	9	
PHOSPHORUS, YELLOW, UNDER WATER	1381	4.2		POLYESTER RESIN KIT	3269	3	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
POLYHALOGENATED BIPHENYLS, LIQUID	3151	9		POTASSIUM HYDROGENDIFLUORIDE, SOLID	1811	8	
POLYHALOGENATED BIPHENYLS, SOLID	3152	9		POTASSIUM HYDROGENDIFLUORIDE, SOLUTION	3421	8	
POLYHALOGENATED TERPHENYLS, LIQUID	3151	9		POTASSIUM HYDROGEN SULPHATE	2509	8	
POLYHALOGENATED TERPHENYLS, SOLID	3152	9		POTASSIUM HYDROSULPHITE, see	1929	4.2	
POLYMERIC BEADS, EXPANDABLE, evolving flammable vapour	2211	9		Potassium hydroxide, liquid, see	1814	8	
Polystyrene beads, expandable, see	2211	9		POTASSIUM HYDROXIDE, SOLID	1813	8	
POTASSIUM	2257	4.3		POTASSIUM HYDROXIDE SOLUTION	1814	8	
POTASSIUM ARSENATE	1677	6.1		POTASSIUM METAL ALLOYS, LIQUID	1420	4.3	
POTASSIUM ARSENITE	1678	6.1		POTASSIUM METAL ALLOYS, SOLID	3403	4.3	
Potassium bifluoride, see	1811	8		POTASSIUM METAVANADATE	2864	6.1	
Potassium bisulphate, see	2509	8		POTASSIUM MONOXIDE	2033	8	
Potassium bisulphite solution, see	2693	8		POTASSIUM NITRATE	1486	5.1	
POTASSIUM BOROHYDRIDE	1870	4.3		Potassium nitrate and sodium nitrate mixture, see	1499	5.1	
POTASSIUM BROMATE	1484	5.1		POTASSIUM NITRATE AND SODIUM NITRITE MIXTURE	1487	5.1	
POTASSIUM CHLORATE	1485	5.1		POTASSIUM NITRITE	1488	5.1	
POTASSIUM CHLORATE, AQUEOUS SOLUTION	2427	5.1		POTASSIUM PERCHLORATE	1489	5.1	
Potassium chlorate mixed with mineral oil, see	0083	1		POTASSIUM PERMANGANATE	1490	5.1	
POTASSIUM CUPROCYANIDE	1679	6.1		POTASSIUM PEROXIDE	1491	5.1	
POTASSIUM CYANIDE, SOLID	1680	6.1		POTASSIUM PERSULPHATE	1492	5.1	
POTASSIUM CYANIDE, SOLUTION	3413	6.1		POTASSIUM PHOSPHIDE	2012	4.3	
Potassium dicyanocuprate (I), see	1679	6.1		Potassium selenate, see	2630	6.1	
POTASSIUM DITHIONITE	1929	4.2		Potassium selenite, see	2630	6.1	
POTASSIUM FLUORIDE, SOLID	1812	6.1		Potassium silicofluoride, see	2655	6.1	
POTASSIUM FLUORIDE, SOLUTION	3422	6.1		POTASSIUM SODIUM ALLOYS, LIQUID	1422	4.3	
POTASSIUM FLUOROACETATE	2628	6.1		POTASSIUM SODIUM ALLOYS, SOLID	3404	4.3	
POTASSIUM FLUROSILICATE	2655	6.1		POTASSIUM SULPHIDE with less than 30% water of crystallization	1382	4.2	
Potassium hexafluorosilicate, see	2655	6.1					
Potassium hydrate, see	1814	8					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
POTASSIUM SULPHIDE, ANHYDROUS	1382	4.2		PROPADIENE, STABILIZED	2200	2	
POTASSIUM SULPHIDE, HYDRATED with not less than 30% water of crystallization	1847	8		Propadiene and methyl acetylene mixture, stabilized, see	1060	2	
POTASSIUM SUPEROXIDE	2466	5.1		PROPANE	1978	2	
Potassium tetracyano-mercurate (II), see	1626	6.1		PROPANETHIOLS	2402	3	
POWDER CAKE, WETTED with not less than 17% alcohol, by mass	0433	1		n-PROPANOL	1274	3	
POWDER CAKE, WETTED with not less than 25% water, by mass	0159	1		PROPELLANT, LIQUID	0495 0497	1 1	
POWDER PASTE, see	0159 0433	1 1		PROPELLANT, SOLID	0498 0499 0501	1 1 1	
POWDER, SMOKELESS	0160 0161	1 1		Propellant with a single base, Propellant with a double base, Propellant with a triple base, see	0160 0161	1 1	
Power devices, explosive, see	0275 0276 0323 0381	1 1 1 1		Propene, see	1077	2	
PRIMERS, CAP TYPE	0044 0377 0378	1 1 1		PROPIONALDEHYDE	1275	3	
Primers, small arms, see	0044	1		PROPIONIC ACID with not less than 10% and less than 90% acid by mass	1848	8	
PRIMERS, TUBULAR	0319 0320 0376	1 1 1		PROPIONIC ACID with not less than 90% acid by mass	3463	8	
PRINTING INK, flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable	1210	3		PROPIONIC ANHYDRIDE	2496	8	
Projectiles, illuminating, see	0171 0254 0297	1 1 1		PROPIONITRILE	2404	3	
PROJECTILES, inert with tracer	0345 0424 0425	1 1 1		PROPIONYL CHLORIDE	1815	3	
PROJECTILES with burster or expelling charge	0346 0347 0426 0427 0434 0435	1 1 1 1 1 1		n-PROPYL ACETATE	1276	3	
PROJECTILES with bursting charge	0167 0168 0169 0324 0344	1 1 1 1 1		PROPYL ALCOHOL, NORMAL, see	1274	3	
				PROPYLAMINE	1277	3	
				n-PROPYLBENZENE	2364	3	
				Propyl chloride, see	1278	3	
				n-PROPYL CHLOROFORMATE	2740	6.1	
				PROPYLENE	1077	2	
				PROPYLENE CHLOROHYDRIN	2611	6.1	
				1,2-PROPYLENEDIAMINE	2258	8	
				Propylene dichloride, see	1279	3	
				PROPYLENEIMINE, STABILIZED	1921	3	
				PROPYLENE OXIDE	1280	3	

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PROPYLENE TETRAMER	2850	3		Quinone, see	2587	6.1	
Propylene trimer, see	2057	3		RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - ARTICLES MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or NATURAL THORIUM	2909	7	
PROPYL FORMATES	1281	3					
n-PROPYL ISOCYANATE	2482	6.1					
Propyl mercaptan, see	2402	3		RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - EMPTY PACKAGING	2908	7	
n-PROPYL NITRATE	1865	3					
PROPYLTRICHLOROSILANE	1816	8		RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - INSTRUMENTS or ARTICLES	2911	7	
Pyrazine hexahydride, see	2579	8					
PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	3350	3		RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY OF MATERIAL	2910	7	
PYRETHROID PESTICIDE, LIQUID, TOXIC	3352	6.1		RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY	2912	7	
PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3351	6.1		(LSA-I), non fissile or fissile- excepted			
PYRETHROID PESTICIDE, SOLID, TOXIC	3349	6.1		RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), FISSILE	3324	7	
PYRIDINE	1282	3		RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY	3321	7	
Pyrophoric organometallic compound, water-reactive, n.o.s., liquid, see	3394	4.2		(LSA-II), non fissile or fissile- excepted			
Pyrophoric organometallic compound, water-reactive, n.o.s., solid, see	3393	4.2		RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY, (LSA-III), FISSILE	3325	7	
PYROPHORIC ALLOY, N.O.S.	1383	4.2		RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III), non fissile or fissile- excepted	3322	7	
PYROPHORIC LIQUID, INORGANIC, N.O.S.	3194	4.2					
PYROPHORIC LIQUID, ORGANIC, N.O.S.	2845	4.2		RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), FISSILE	3326	7	
PYROPHORIC METAL, N.O.S.	1383	4.2					
PYROPHORIC SOLID, INORGANIC, N.O.S.	3200	4.2		RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), non fissile or fissile-excepted	2913	7	
PYROPHORIC SOLID, ORGANIC, N.O.S.	2846	4.2					
PYROSULPHURYL CHLORIDE	1817	8		RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, FISSILE	3331	7	
Pyroxylin solution, see	2059	3					
PYRROLIDINE	1922	3		RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, non fissile or fissile-excepted	2919	7	
QUINOLINE	2656	6.1					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE, non-special form	3327	7		REFRIGERANT GAS R 13, see	1022	2	
				REFRIGERANT GAS R 13B1, see	1009	2	
RADIOACTIVE MATERIAL, TYPE A PACKAGE, non-special form, non fissile or fissile-excepted	2915	7		REFRIGERANT GAS R 14, see	1982	2	
				REFRIGERANT GAS R 21, see	1029	2	
RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE	3333	7		REFRIGERANT GAS R 22, see	1018	2	
				REFRIGERANT GAS R 23, see	1984	2	
RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, non fissile or fissile-excepted	3332	7		REFRIGERANT GAS R 32, see	3252	2	
				REFRIGERANT GAS R 40, see	1063	2	
RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE	3329	7		REFRIGERANT GAS R 41, see	2454	2	
				REFRIGERANT GAS R 114, see	1958	2	
RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, non fissile or fissile-excepted	2917	7		REFRIGERANT GAS R 115, see	1020	2	
				REFRIGERANT GAS R 116, see	2193	2	
RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE	3328	7		REFRIGERANT GAS R 124, see	1021	2	
				REFRIGERANT GAS R 125, see	3220	2	
RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, non fissile or fissile-excepted	2916	7		REFRIGERANT GAS R 133a, see	1983	2	
				REFRIGERANT GAS R 134a, see	3159	2	
RADIOACTIVE MATERIAL, TYPE C PACKAGE, FISSILE	3330	7		REFRIGERANT GAS R 142b, see	2517	2	
				REFRIGERANT GAS R 143a, see	2035	2	
RADIOACTIVE MATERIAL, TYPE C PACKAGE, non fissile or fissile-excepted	3323	7		REFRIGERANT GAS R 152a, see	1030	2	
				REFRIGERANT GAS R 161, see	2453	2	
RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE	2977	7		REFRIGERANT GAS R 218, see	2424	2	
				REFRIGERANT GAS R 227, see	3296	2	
RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, non fissile or fissile-excepted	2978	7		REFRIGERANT GAS R 404A	3337	2	
Rags, oily	1856	4.2	Not subject to ADN	REFRIGERANT GAS R 407A	3338	2	
				REFRIGERANT GAS R 407B	3339	2	
RDX, see	0072	1		REFRIGERANT GAS R 407C	3340	2	
	0391	1					
	0483	1					
RECEPTACLES, SMALL, CONTAINING GAS without a release device, non-refillable	2037	2		REFRIGERANT GAS R 500, see	2602	2	
				REFRIGERANT GAS R 502, see	1973	2	
Red phosphorus, see	1338	4.1		REFRIGERANT GAS R 503, see	2599	2	
REFRIGERANT GAS, N.O.S., such as mixture F1, mixture F2 or mixture P2	1078	2		REFRIGERANT GAS R 1132a, see	1959	2	
				REFRIGERANT GAS R 1216, see	1858	2	
REFRIGERANT GAS R 12, see	1028	2		REFRIGERANT GAS R 1318, see	2422	2	
REFRIGERANT GAS R 12B1, see	1974	2		REFRIGERANT GAS RC 318, see	1976	2	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
REFRIGERATING MACHINES containing flammable, non-toxic, liquefied gas	3358	2		RUBIDIUM HYDROXIDE SOLUTION	2677	8	
REFRIGERATING MACHINES containing non-flammable, non-toxic, gases or ammonia solutions (UN 2672)	2857	2		Saltpetre, see	1486	5.1	
REGULATED MEDICAL WASTE, N.O.S.	3291	6.2		SAMPLES, EXPLOSIVE, other than initiating explosive	0190	1	
RELEASE DEVICES, EXPLOSIVE	0173	1		Sand acid, see	1778	8	
RESIN SOLUTION, flammable	1866	3		SEAT-BELT PRETENSIONERS	0503 3268	1 9	
Resorcin, see	2876	6.1		SEED CAKE with more than 1.5% oil and not more than 11% moisture	1386	4.2	
RESORCINOL	2876	6.1		SEED CAKE with not more than 1.5% oil and not more than 11% moisture	2217	4.2	
RIVETS, EXPLOSIVE	0174	1		Seed expellers, see	1386 2217	4.2 4.2	
ROCKET MOTORS	0186 0280 0281	1 1 1		SELENATES	2630	6.1	
ROCKET MOTORS, LIQUID FUELLED	0395 0396	1 1		SELENIC ACID	1905	8	
ROCKET MOTORS WITH HYPERGOLIC LIQUIDS with or without expelling charge	0250 0322	1 1		SELENITES	2630	6.1	
ROCKETS with bursting charge	0180 0181 0182 0295	1 1 1 1		SELENIUM COMPOUND, LIQUID, N.O.S.	3440	6.1	
ROCKETS with expelling charge	0436 0437 0438	1 1 1		SELENIUM COMPOUND, SOLID, N.O.S.	3283	6.1	
ROCKETS with inert head	0183 0502	1 1		SELENIUM DISULPHIDE	2657	6.1	
ROCKETS, LINE-THROWING	0238 0240 0453	1 1 1		SELENIUM HEXAFLUORIDE	2194	2	
ROCKETS, LIQUID FUELLED with bursting charge	0397 0398	1 1		SELENIUM OXYCHLORIDE	2879	8	
ROSIN OIL	1286	3		SELF-HEATING LIQUID, CORROSIVE, INORGANIC, N.O.S.	3188	4.2	
RUBBER SCRAP, powdered or granulated	1345	4.1		SELF-HEATING LIQUID, CORROSIVE, ORGANIC, N.O.S.	3185	4.2	
RUBBER SHODDY, powdered or granulated	1345	4.1		SELF-HEATING LIQUID, INORGANIC, N.O.S.	3186	4.2	
RUBBER SOLUTION	1287	3		SELF-HEATING LIQUID, ORGANIC, N.O.S.	3183	4.2	
RUBIDIUM	1423	4.3		SELF-HEATING LIQUID, TOXIC, INORGANIC, N.O.S.	3187	4.2	
RUBIDIUM HYDROXIDE	2678	8		SELF-HEATING LIQUID, TOXIC, ORGANIC, N.O.S.	3184	4.2	
				SELF-HEATING SOLID, CORROSIVE, INORGANIC, N.O.S.	3192	4.2	
				SELF-HEATING SOLID, CORROSIVE, ORGANIC, N.O.S.	3126	4.2	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
SELF-HEATING SOLID, INORGANIC, N.O.S.	3190	4.2		SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED	3236	4.1	
SELF-HEATING SOLID, ORGANIC, N.O.S.	3088	4.2		SELF-REACTIVE SOLID TYPE E	3228	4.1	
SELF-HEATING SOLID, OXIDIZING, N.O.S	3127	4.2	Carriage prohibited	SELF-REACTIVE SOLID TYPE E, TEMPERATURE CONTROLLED	3238	4.1	
SELF-HEATING SOLID, TOXIC, INORGANIC, N.O.S.	3191	4.2		SELF-REACTIVE SOLID TYPE F	3230	4.1	
SELF-HEATING SOLID, TOXIC, ORGANIC, N.O.S.	3128	4.2		SELF-REACTIVE SOLID TYPE F, TEMPERATURE CONTROLLED	3240	4.1	
SELF-REACTIVE LIQUID TYPE B	3221	4.1		SHALE OIL	1288	3	
SELF-REACTIVE LIQUID TYPE B, TEMPERATURE CONTROLLED	3231	4.1		Shaped charges, see	0059	1	
SELF-REACTIVE LIQUID TYPE C	3223	4.1			0439	1	
SELF-REACTIVE LIQUID TYPE C, TEMPERATURE CONTROLLED	3233	4.1			0440	1	
					0441	1	
SELF-REACTIVE LIQUID TYPE D	3225	4.1		Shellac, see	1263	3	
SELF-REACTIVE LIQUID TYPE D, TEMPERATURE CONTROLLED	3235	4.1			3066	8	
					3469	3	
				SIGNAL DEVICES, HAND	3470	8	
					0191	1	
					0373	1	
				SIGNALS, DISTRESS, ship	0194	1	
					0195	1	
					0505	1	
					0506	1	
				Signals, distress, ship, water-activated, see	0249	1	
				SIGNALS, RAILWAY TRACK, EXPLOSIVE	0192	1	
					0193	1	
					0492	1	
					0493	1	
				SIGNALS, SMOKE	0196	1	
					0197	1	
					0313	1	
					0487	1	
					0507	1	
SELF-REACTIVE SOLID TYPE B	3222	4.1		SILANE	2203	2	
SELF-REACTIVE SOLID TYPE B, TEMPERATURE CONTROLLED	3232	4.1		Silicofluoric acid, see	1778	8	
				Silicofluorides, n.o.s., see	2856	6.1	
SELF-REACTIVE SOLID TYPE C	3224	4.1		Silicon chloride, see	1818	8	
SELF-REACTIVE SOLID TYPE C, TEMPERATURE CONTROLLED	3234	4.1		SILICON POWDER, AMORPHOUS	1346	4.1	
				SILICON TETRACHLORIDE	1818	8	
SELF-REACTIVE SOLID TYPE D	3226	4.1		SILICON TETRAFLUORIDE	1859	2	
				SILVER ARSENITE	1683	6.1	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
SILVER CYANIDE	1684	6.1		Sodium chlorate mixed with dinitrotoluene, see	0083	1	
SILVER NITRATE	1493	5.1		SODIUM CHLORITE	1496	5.1	
SILVER PICRATE, WETTED with not less than 30% water, by mass	1347	4.1		SODIUM CHLOROACETATE	2659	6.1	
SLUDGE ACID	1906	8		SODIUM CUPROCYANIDE, SOLID	2316	6.1	
SODA LIME with more than 4% sodium hydroxide	1907	8		SODIUM CUPROCYANIDE SOLUTION	2317	6.1	
SODIUM	1428	4.3		SODIUM CYANIDE, SOLID	1689	6.1	
Sodium aluminate, solid	2812	8	Not subject to ADN	SODIUM CYANIDE, SOLUTION	3414	6.1	
SODIUM ALUMINATE SOLUTION	1819	8		Sodium dicyanocuprate (I), solid, see	2316	6.1	
SODIUM ALUMINIUM HYDRIDE	2835	4.3		Sodium dicyanocuprate (I) solution, see	2317	6.1	
SODIUM AMMONIUM VANADATE	2863	6.1		Sodium dimethylarsenate, see	1688	6.1	
SODIUM ARSANILATE	2473	6.1		SODIUM DINITRO-o-CRESOLATE, dry or wetted with less than 15% water, by mass	0234	1	
SODIUM ARSENATE	1685	6.1		SODIUM DINITRO-o-CRESOLATE, WETTED with not less than 10% water, by mass	3369	4.1	
SODIUM ARSENITE, AQUEOUS SOLUTION	1686	6.1		SODIUM DINITRO-o-CRESOLATE, WETTED with not less than 15% water, by mass	1348	4.1	
SODIUM ARSENITE, SOLID	2027	6.1		Sodium dioxide, see	1504	5.1	
SODIUM AZIDE	1687	6.1		SODIUM DITHIONITE	1384	4.2	
Sodium bifluoride, see	2439	8		SODIUM FLUORIDE, SOLID	1690	6.1	
Sodium binoxide, see	1504	5.1		SODIUM FLUORIDE, SOLUTION	3415	6.1	
Sodium bisulphite solution, see	2693	8		SODIUM FLUOROACETATE	2629	6.1	
SODIUM BOROHYDRIDE	1426	4.3		SODIUM FLUROSILICATE	2674	6.1	
SODIUM BOROHYDRIDE AND SODIUM HYDROXIDE SOLUTION, with not more than 12% sodium borohydride and not more than 40% sodium hydroxide by mass	3320	8		Sodium hexafluorosilicate, see	2674	6.1	
SODIUM BROMATE	1494	5.1		Sodium hydrate, see	1824	8	
SODIUM CACODYLATE	1688	6.1		SODIUM HYDRIDE	1427	4.3	
SODIUM CARBONATE PEROXYHYDRATE	3378	5.1		Sodium hydrogen 4-amino-phenylarsenate, see	2473	6.1	
SODIUM CHLORATE	1495	5.1		SODIUM HYDROGENDIFLUORIDE	2439	8	
SODIUM CHLORATE, AQUEOUS SOLUTION	2428	5.1		SODIUM HYDROSULPHIDE with less than 25% water of crystallization	2318	4.2	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
SODIUM HYDROSULPHIDE, HYDRATED with not less than 25% water of crystallization	2949	8		SODIUM SULPHIDE, ANHYDROUS	1385	4.2	
SODIUM HYDROSULPHITE, see	1384	4.2		SODIUM SULPHIDE with less than 30% water of crystallization	1385	4.2	
SODIUM HYDROXIDE, SOLID	1823	8		SODIUM SULPHIDE, HYDRATED with not less than 30% water	1849	8	
SODIUM HYDROXIDE SOLUTION	1824	8		SODIUM SUPEROXIDE	2547	5.1	
Sodium metasilicate pentahydrate, see	3253	8		SOLIDS CONTAINING CORROSIVE LIQUID, N.O.S.	3244	8	
SODIUM METHYLATE	1431	4.2		SOLIDS or mixtures of solids (such as preparations and wastes) CONTAINING FLAMMABLE LIQUID, N.O.S. having a flash-point up to 60°C	3175	4.1	
SODIUM METHYLATE SOLUTION in alcohol	1289	3		SOLIDS CONTAINING TOXIC LIQUID, N.O.S.	3243	6.1	
SODIUM MONOXIDE	1825	8		Solvents, flammable, n.o.s., see	1993	3	
SODIUM NITRATE	1498	5.1		Solvents, flammable, toxic, n.o.s., see	1992	3	
SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE	1499	5.1		SOUNDING DEVICES, EXPLOSIVE	0204 0296 0374 0375	1 1 1 1	
SODIUM NITRITE	1500	5.1		Squibs, see	0325 0454	1 1	
Sodium nitrite and potassium nitrate mixture, see	1487	5.1		Stain, see	1263 3066 3469 3470 1827	3 8 3 8 8	
SODIUM PENTACHLOROPHENATE	2567	6.1		STANNIC CHLORIDE, ANHYDROUS	2440	8	
SODIUM PERBORATE MONOHYDRATE	3377	5.1		STANNIC CHLORIDE PENTAHYDRATE	1433	4.3	
SODIUM PERCHLORATE	1502	5.1		STANNIC PHOSPHIDES	2793	4.2	
SODIUM PERMANGANATE	1503	5.1		Steel swarf, see	2676	2	
SODIUM PEROXIDE	1504	5.1		STIBINE	1327	4.1	Not subject to ADN
SODIUM PEROXOBORATE, ANHYDROUS	3247	5.1		Straw	1383	4.2	
SODIUM PERSULPHATE	1505	5.1		Strontium alloys, pyrophoric, see	1691	6.1	
SODIUM PHOSPHIDE	1432	4.3		STRONTIUM ARSENITE	1506	5.1	
SODIUM PICRAMATE, dry or wetted with less than 20% water, by mass	0235	1		STRONTIUM CHLORATE	1509	5.1	
SODIUM PICRAMATE, WETTED with not less than 20% water, by mass	1349	4.1		Strontium dioxide, see	1507	5.1	
Sodium potassium alloys, liquid, see	1422	4.3		STRONTIUM NITRATE			
Sodium selenate, see	2630	6.1					
Sodium selenite, see	2630	6.1					
Sodium silicofluoride, see	2674	6.1					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
STRONTIUM PERCHLORATE	1508	5.1		SUBSTITUTED NITROPHENOL PESTICIDE, SOLID, TOXIC	2779	6.1	
STRONTIUM PEROXIDE	1509	5.1		SULPHAMIC ACID	2967	8	
STRONTIUM PHOSPHIDE	2013	4.3		SULPHUR	1350	4.1	
STRYCHNINE	1692	6.1		SULPHUR CHLORIDES	1828	8	
STRYCHNINE SALTS	1692	6.1		Sulphur dichloride, see	1828	8	
STYPHNIC ACID, see	0219	1		SULPHUR DIOXIDE	1079	2	
	0394	1					
STYRENE MONOMER, STABILIZED	2055	3		Sulphuretted hydrogen, see	1053	2	
SUBSTANCES, EVI, N.O.S., see	0482	1		SULPHUR HEXAFLUORIDE	1080	2	
SUBSTANCES, EXPLOSIVE, N.O.S.	0357	1		SULPHURIC ACID with more than 51% acid	1830	8	
	0358	1					
	0359	1		SULPHURIC ACID with not more than 51% acid	2796	8	
	0473	1					
	0474	1		SULPHURIC ACID, FUMING	1831	8	
	0475	1					
	0476	1		SULPHURIC ACID, SPENT	1832	8	
	0477	1					
	0478	1		Sulphuric and hydrofluoric acid mixture, see	1786	8	
	0479	1					
	0480	1		SULPHUR, MOLTEN	2448	4.1	
	0481	1					
	0485	1		Sulphur monochloride, see	1828	8	
SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE, N.O.S.	0482	1					
Substances liable to spontaneous combustion, n.o.s., see	2845	4.2		SULPHUROUS ACID	1833	8	
	2846	4.2					
	3194	4.2		SULPHUR TETRAFLUORIDE	2418	2	
	3200	4.2					
SUBSTANCES WITH A FLASH-POINT ABOVE 60 °C which are carried heated within a limiting range of 15K below their flash-point	9001	3	Dangerous in tank vessels only	SULPHUR TRIOXIDE, STABILIZED	1829	8	
SUBSTANCES WITH A FLASH-POINT ABOVE 60 °C AND NOT MORE THAN 100 °C, which do not belong to another Class	9003	9	Dangerous in tank vessels only	SULPHURYL CHLORIDE	1834	8	
				SULPHURYL FLUORIDE	2191	2	
SUBSTANCES WITH AN AUTO-IGNITION TEMPERATURE OF 200 °C AND BELOW, n.o.s.	9002	3	Dangerous in tank vessels only	Talcum with tremolite and/or actinolite, see	2590	9	
				TARS, LIQUID, including road asphalt and oils, bitumen and cut backs, with a flash-point not greater than 60 °C	1999	3	
SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2780	3		Tars, liquid, with a flash-point above 60 °C, at or above its flash-point, see	3256	3	
				Tars, liquid, at or above 100 °C and below its flash-point, see	3257	9	
				Tartar emetic, see	1551	6.1	
SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC	3014	6.1		TEAR GAS CANDLES	1700	6.1	
SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3013	6.1		TEAR GAS SUBSTANCE, LIQUID, N.O.S.	1693	6.1	

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TEAR GAS SUBSTANCE, SOLID, N.O.S.	3448	6.1		Tetramethylene cyanide, see	2205	6.1	
TELLURIUM COMPOUND, N.O.S.	3284	6.1		Tetramethyl lead, see	1649	6.1	
TELLURIUM HEXAFLUORIDE	2195	2		TETRAMETHYLSILANE	2749	3	
TERPENE HYDROCARBONS, N.O.S.	2319	3		TETRANITROANILINE	0207	1	
TERPINOLENE	2541	3		TETRANITROMETHANE	1510	5.1	
TETRABROMOETHANE	2504	6.1		TETRAPROPYL ORTHOTITANATE	2413	3	
1,1,2,2-TETRACHLOROETHANE	1702	6.1		TETRAZENE, WETTED with not less than 30% water, or mixture of alcohol and water, by mass, see	0114	1	
TETRACHLOROETHYLENE	1897	6.1		TETRAZOL-1-ACETIC ACID	0407	1	
TETRAETHYL DITHIO-PYROPHOSPHATE	1704	6.1		1H-TETRAZOLE	0504	1	
TETRAETHYLENEPENTAMINE	2320	8		TETRYL, see	0208	1	
Tetraethyl lead, see	1649	6.1		Textile waste, wet	1857	4.2	Not subject to ADN
TETRAETHYL SILICATE	1292	3		THALLIUM CHLORATE	2573	5.1	
Tetraethoxysilane, see	1292	3		Thallium (I) chlorate, see	2573	5.1	
Tetrafluorodichloroethane, see	1958	2		THALLIUM COMPOUND, N.O.S.	1707	6.1	
1,1,1,2-TETRAFLUOROETHANE	3159	2		THALLIUM NITRATE	2727	6.1	
TETRAFLUROETHYLENE, STABILIZED	1081	2		Thallium (I) nitrate, see	2727	6.1	
TETRAFLUOROMETHANE	1982	2		Thallos chlorate, see	2573	5.1	
1,2,3,6-TETRAHYDRO-BENZALDEHYDE	2498	3		4-THIAPENTANAL	2785	6.1	
TETRAHYDROFURAN	2056	3		Thia-4-pentanal, see	2785	6.1	
TETRAHYDRO-FURFURYLAMINE	2943	3		THIOACETIC ACID	2436	3	
Tetrahydro-1,4-oxazine, see	2054	3		THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2772	3	
TETRAHYDROPHTHALIC ANHYDRIDES with more than 0.05% of maleic anhydride	2698	8		THIOCARBAMATE PESTICIDE, LIQUID, TOXIC	3006	6.1	
1,2,3,6-TETRAHYDROPYRIDINE	2410	3		THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	3005	6.1	
TETRAHYDROTHIOPHENE	2412	3		THIOCARBAMATE PESTICIDE, SOLID, TOXIC	2771	6.1	
Tetramethoxysilane, see	2606	6.1		THIOGLYCOL	2966	6.1	
TETRAMETHYLAMMONIUM HYDROXIDE, SOLID	3423	8		THIOGLYCOLIC ACID	1940	8	
TETRAMETHYLAMMONIUM HYDROXIDE, SOLUTION	1835	8		THIOLACTIC ACID	2936	6.1	
Tetramethylene, see	2601	2		THIONYL CHLORIDE	1836	8	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
THIOPHENE	2414	3		2,4-TOLUYLENEDIAMINE, SOLID	1709	6.1	
Thiophenol, see	2337	6.1					
THIOPHOSGENE	2474	6.1		2,4-TOLUYLENEDIAMINE, SOLUTION	3418	6.1	
THIOPHOSPHORYL CHLORIDE	1837	8		Toluylene diisocyanate, see	2078	6.1	
THIOUREA DIOXIDE	3341	4.2		Tolylene diisocyanate, see	2078	6.1	
Tin (IV) chloride, anhydrous, see	1827	8		Tolyethylene, inhibited, see	2618	3	
Tin (IV) chloride pentahydrate, see	2440	8		TORPEDOES with bursting charge	0329	1	
TINCTURES, MEDICINAL	1293	3			0330	1	
Tin tetrachloride, see	1827	8			0451	1	
TITANIUM DISULPHIDE	3174	4.2		TORPEDOES, LIQUID FUELLED with inert head	0450	1	
TITANIUM HYDRIDE	1871	4.1		TORPEDOES, LIQUID FUELLED with or without bursting charge	0449	1	
TITANIUM POWDER, DRY	2546	4.2		TOXIC BY INHALATION LIQUID, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3381	6.1	
TITANIUM POWDER, WETTED with not less than 25% water	1352	4.1					
TITANIUM SPONGE GRANULES	2878	4.1		TOXIC BY INHALATION LIQUID, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3382	6.1	
TITANIUM SPONGE POWDERS	2878	4.1					
TITANIUM TETRACHLORIDE	1838	8		TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3389	6.1	
TITANIUM TRICHLORIDE MIXTURE	2869	8					
TITANIUM TRICHLORIDE MIXTURE, PYROPHORIC	2441	4.2		TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3390	6.1	
TITANIUM TRICHLORIDE, PYROPHORIC	2441	4.2					
TNT, see	0209	1					
	0388	1					
	0389	1					
TNT mixed with aluminium, see	0390	1					
TNT, WETTED with not less than 30% water, by mass, see	1356	4.1		TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3383	6.1	
TNT, WETTED with not less than 10% water, by mass, see	3366	4.1					
Toe puffs, nitrocellulose base, see	1353	4.1					
TOLUENE	1294	3		TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3384	6.1	
TOLUENE DIISOCYANATE	2078	6.1					
TOLUIDINES, LIQUID	1708	6.1					
TOLUIDINES, SOLID	3451	6.1					
Toluol, see	1294	3					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3387	6.1		TOXIC SOLID, INORGANIC, N.O.S.	3288	6.1	
				TOXIC SOLID, ORGANIC, N.O.S.	2811	6.1	
				TOXIC SOLID, OXIDIZING, N.O.S.	3086	6.1	
TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3387	6.1		TOXIC SOLID, SELF-HEATING, N.O.S.	3124	6.1	
				TOXIC SOLID, WATER-REACTIVE, N.O.S.	3125	6.1	
TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3388	6.1		TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S.	3172	6.1	
				TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.	3462	6.1	
TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3385	6.1		TRACERS FOR AMMUNITION	0212 0306	1 1	
				Tremolite, see	2590	9	
				TRIALLYLAMINE	2610	3	
TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3386	6.1		TRIALLYL BORATE	2609	6.1	
				TRIAZINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash-point less than 23 °C	2764	3	
TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.	3289	6.1		TRIAZINE PESTICIDE, LIQUID, TOXIC	2998	6.1	
TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S.	2927	6.1		TRIAZINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash-point not less than 23 °C	2997	6.1	
TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.	2929	6.1		TRIAZINE PESTICIDE, SOLID, TOXIC	2763	6.1	
TOXIC LIQUID, INORGANIC, N.O.S.	3287	6.1		Tribromoborane, see	2692	8	
TOXIC LIQUID, ORGANIC, N.O.S.	2810	6.1		TRIBUTYLAMINE	2542	6.1	
TOXIC LIQUID, OXIDIZING, N.O.S.	3122	6.1		TRIBUTYLPHOSPHANE	3254	4.2	
TOXIC LIQUID, WATER-REACTIVE, N.O.S.	3123	6.1		Trichloroacetaldehyde, see	2075	6.1	
TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.	3290	6.1		TRICHLOROACETIC ACID	1839	8	
				TRICHLOROACETIC ACID SOLUTION	2564	8	
TOXIC SOLID, CORROSIVE, ORGANIC, N.O.S.	2928	6.1		Trichloroacetaldehyde, see	2075	6.1	
TOXIC SOLID, FLAMMABLE, ORGANIC, N.O.S.	2930	6.1		TRICHLOROACETYL CHLORIDE	2442	8	
				TRICHLOROBENZENES, LIQUID	2321	6.1	
				TRICHLOROBUTENE	2322	6.1	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
1,1,1-TRICHLOROETHANE	2831	6.1		1,3,5-TRIMETHYL-BENZENE	2325	3	
TRICHLOROETHYLENE	1710	6.1		TRIMETHYL BORATE	2416	3	
TRICHLOROISOCYANURIC ACID, DRY	2468	5.1		TRIMETHYLCHLORO-SILANE	1298	3	
Trichloronitromethane, see	1580	6.1		TRIMETHYLCYCLO- HEXYLAMINE	2326	8	
TRICHLOROSILANE	1295	4.3		Trimethylene chlorobromide, see	2688	6.1	
1,3,5-Trichloro-s-triazine-2,4,6-trione, see	2468	5.1		TRIMETHYLHEXA- METHYLENEDIAMINES	2327	8	
2,4,6-Trichloro-1,3,5- triazine, see	2670	8		TRIMETHYLHEXAMETHYLENE DIISOCYANATE	2328	6.1	
TRICRESYL PHOSPHATE with more than 3% ortho isomer	2574	6.1		2,4,4-Trimethylpentene-1, see	2050	3	
TRIETHYLAMINE	1296	3		2,4,4-Trimethylpentene-2, see	2050	3	
Triethyl borate, see	1176	3		TRIMETHYL PHOSPHITE	2329	3	
TRIETHYLENETETRAMINE	2259	8		TRINITROANILINE	0153	1	
Triethyl orthoformate, see	2524	3		TRINITROANISOLE	0213	1	
TRIETHYL PHOSPHITE	2323	3		TRINITROBENZENE, dry or wetted with less than 30% water, by mass	0214	1	
TRIFLUOROACETIC ACID	2699	8		TRINITROBENZENE, WETTED with not less than 10% water, by mass	3367	4.1	
TRIFLUOROACETYL CHLORIDE	3057	2		TRINITROBENZENE, WETTED with not less than 30% water, by mass	1354	4.1	
Trifluorobromomethane, see	1009	2		TRINITROBENZENE- SULPHONIC ACID	0386	1	
Trifluorochloroethane, see	1983	2		TRINITROBENZOIC ACID, dry or wetted with less than 30% water, by mass	0215	1	
TRIFLUOROCHLORO- ETHYLENE, STABILIZED	1082	2		TRINITROBENZOIC ACID, WETTED with not less than 10% water, by mass	3368	4.1	
Trifluorochloromethane, see	1022	2		TRINITROBENZOIC ACID, WETTED with not less than 30% water, by mass	1355	4.1	
1,1,1-TRIFLUOROETHANE	2035	2		TRINITROCHLOROENZENE	0155	1	
TRIFLUOROMETHANE	1984	2		TRINITROCHLOROENZENE WETTED with not less than 10% water, by mass	3365	4.1	
TRIFLUOROMETHANE, REFRIGERATED LIQUID	3136	2		TRINITRO-m-CRESOL	0216	1	
2-TRIFLUOROMETHYLANILINE	2942	6.1		TRINITROFLUORENONE	0387	1	
3-TRIFLUOROMETHYLANILINE	2948	6.1		TRINITRONAPHTHALENE	0217	1	
TRIIISOBUTYLENE	2324	3					
TRIIISOPROPYL BORATE	2616	3					
TRIMETHYLACETYL CHLORIDE	2438	6.1					
TRIMETHYLAMINE, ANHYDROUS	1083	2					
TRIMETHYLAMINE, AQUEOUS SOLUTION, not more than 50% trimethylamine, by mass	1297	3					

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
TRINITROPHENETOLE	0218	1		UNDECANE	2330	3	
TRINITROPHENOL, dry or wetted with less than 30% water, by mass	0154	1		UREA HYDROGEN PEROXIDE	1511	5.1	
TRINITROPHENOL (PICRIC ACID), WETTED with not less than 30% water, by mass	1344	4.1		UREA NITRATE, dry or wetted with less than 20% water, by mass	0220	1	
TRINITROPHENOL WETTED with not less than 10% water, by mass	3364	4.1		UREA NITRATE, WETTED with not less than 10% water, by mass	3370	4.1	
TRINITROPHENYL-METHYLNITRAMINE	0208	1		UREA NITRATE, WETTED with not less than 20% water, by mass	1357	4.1	
TRINITRORESORCINOL, dry or wetted with less than 20% water, or mixture of alcohol and water, by mass	0219	1		Valeral, see	2058	3	
TRINITRORESORCINOL, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	0394	1		VALERALDEHYDE	2058	3	
TRINITROTOLUENE (TNT), dry or wetted with less than 30% water, by mass	0209	1		n-Valeraldehyde, see	2058	3	
TRINITROTOLUENE AND HEXANITROSTILBENE MIXTURE	0388	1		Valeric aldehyde, see	2058	3	
TRINITROTOLUENE MIXTURE CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE	0389	1		VALERYL CHLORIDE	2502	8	
TRINITROTOLUENE AND TRINITROBENZENE MIXTURE	0388	1		VANADIUM COMPOUND, N.O.S.	3285	6.1	
TRINITROTOLUENE, WETTED with not less than 10% water, by mass	3366	4.1		Vanadium (IV) oxide sulphate, see	2931	6.1	
TRINITROTOLUENE, WETTED with not less than 30% water, by mass	1356	4.1		Vanadium oxysulphate, see	2931	6.1	
TRIPROPYLAMINE	2260	3		VANADIUM OXYTRICHLORIDE	2443	8	
TRIPROPYLENE	2057	3		VANADIUM PENTOXIDE, non-fused form	2862	6.1	
TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE SOLUTION	2501	6.1		VANADIUM TETRACHLORIDE	2444	8	
TRITONAL	0390	1		VANADIUM TRICHLORIDE	2475	8	
Tropilidene, see	2603	3		VANADYL SULPHATE	2931	6.1	
TUNGSTEN HEXAFLUORIDE	2196	2		Varnish, see	1263	3	
TURPENTINE	1299	3			3066	8	
TURPENTINE SUBSTITUTE	1300	3			3469	3	
					3470	8	
				Vehicle, flammable gas powered or vehicle, flammable liquid powered	3166	9	Not subject to ADN
				Villiumite, see	1690	6.1	
				VINYL ACETATE, STABILIZED	1301	3	
				Vinylbenzene, see	2055	3	
				VINYL BROMIDE, STABILIZED	1085	2	
				VINYL BUTYRATE, STABILIZED	2838	3	
				VINYL CHLORIDE, STABILIZED	1086	2	
				VINYL CHLOROACETATE	2589	6.1	
				VINYL ETHYL ETHER, STABILIZED	1302	3	
				VINYL FLUORIDE, STABILIZED	1860	2	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
VINYLDENE CHLORIDE, STABILIZED	1303	3		WOOD PRESERVATIVES, LIQUID	1306	3	
VINYL ISOBUTYL ETHER, STABILIZED	1304	3		Wool waste, wet	1387	4.2	Not subject to ADN
VINYL METHYL ETHER, STABILIZED	1087	2		XANTHATES	3342	4.2	
VINYLPYRIDINES, STABILIZED	3073	6.1		XENON	2036	2	
VINYLTOLUENES, STABILIZED	2618	3		XENON, REFRIGERATED LIQUID	2591	2	
VINYLTRICHLOROSILANE	1305	3		XYLENES	1307	3	
Warheads for guided missiles, see	0286	1		XYLENOLS, LIQUID	3430	6.1	
	0287	1		XYLENOLS, SOLID	2261	6.1	
	0369	1		XYLIDINES, LIQUID	1711	6.1	
	0370	1					
	0371	1					
WARHEADS, ROCKET with burster or expelling charge	0370	1		XYLIDINES, SOLID	3452	6.1	
	0371	1		Xylols, see	1307	3	
WARHEADS, ROCKET with bursting charge	0286	1		XYLYL BROMIDE, LIQUID	1701	6.1	
	0287	1		XYLYL BROMIDE, SOLID	3417	6.1	
	0369	1					
WARHEADS, TORPEDO with bursting charge	0221	1		ZINC AMMONIUM NITRITE	1512	5.1	
				ZINC ARSENATE	1712	6.1	
WATER-REACTIVE LIQUID, N.O.S.	3148	4.3		ZINC ARSENATE AND ZINC ARSENITE MIXTURE	1712	6.1	
WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.	3129	4.3		ZINC ARSENITE	1712	6.1	
WATER-REACTIVE LIQUID, TOXIC, N.O.S.	3130	4.3		ZINC ASHES	1435	4.3	
				Zinc bisulphite solution, see	2693	8	
WATER-REACTIVE SOLID, N.O.S.	2813	4.3		ZINC BROMATE	2469	5.1	
WATER-REACTIVE SOLID, CORROSIVE, N.O.S.	3131	4.3		ZINC CHLORATE	1513	5.1	
				ZINC CHLORIDE, ANHYDROUS	2331	8	
WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.	3132	4.3		ZINC CHLORIDE SOLUTION	1840	8	
WATER-REACTIVE SOLID, OXIDIZING, N.O.S.	3133	4.3	Carriage prohibited	ZINC CYANIDE	1713	6.1	
				ZINC DITHIONITE	1931	9	
WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.	3135	4.3		ZINC DUST	1436	4.3	
WATER-REACTIVE SOLID, TOXIC, N.O.S.	3134	4.3		ZINC FLUOROSILICATE	2855	6.1	
White arsenic, see	1561	6.1		Zinc hexafluorosilicate, see	2855	6.1	
WHITE ASBESTOS (chrysotile, actinolite, anthophyllite, tremolite)	2590	9		ZINC HYDROSULPHITE, see	1931	9	
				ZINC NITRATE	1514	5.1	
White spirit, see	1300	3		ZINC PERMANGANATE	1515	5.1	

Name and description	UN No.	Class	Remarks	Name and description	UN No.	Class	Remarks
ZINC PEROXIDE	1516	5.1		ZIRCONIUM HYDRIDE	1437	4.1	
ZINC PHOSPHIDE	1714	4.3		ZIRCONIUM NITRATE	2728	5.1	
ZINC POWDER	1436	4.3		ZIRCONIUM PICRAMATE, dry or wetted with less than 20% water, by mass	0236	1	
ZINC RESINATE	2714	4.1					
Zinc selenate, see	2630	4.1		ZIRCONIUM PICRAMATE, WETTED with not less than 20% water, by mass	1517	4.1	
Zinc selenite, see	2630	4.1					
Zinc silicofluoride, see	2855	6.1		ZIRCONIUM POWDER, DRY	2008	4.2	
ZIRCONIUM, DRY, coiled wire, finished metal sheets, strip (thinner than 254 microns but not thinner than 18 microns)	2858	4.1		ZIRCONIUM POWDER, WETTED with not less than 25% water	1358	4.1	
				ZIRCONIUM SCRAP	1932	4.2	
ZIRCONIUM, DRY, finished sheets, strip or coiled wire	2009	4.2		ZIRCONIUM SUSPENDED IN A FLAMMABLE LIQUID	1308	3	
				ZIRCONIUM TETRACHLORIDE	2503	8	

3.2.3 **Table C: List of dangerous goods accepted for carriage in tank vessels in numerical order**

Explanations concerning Table C:

As a rule, each row of Table C of this Chapter deals with the substance(s) covered by a specific UN number or identification number. However, when substances belonging to the same UN number or identification number have different chemical properties, physical properties and/or carriage conditions, several consecutive rows may be used for that UN number or identification number.

Each column of Table C is dedicated to a specific subject as indicated in the explanatory notes below. The intersection of columns and rows (cell) contains information concerning the subject treated in that column, for the substance(s) of that row:

- The first four cells identify the substance(s) belonging to that row;
- The following cells give the applicable special provisions, either in the form of complete information or in coded form. The codes cross-refer to detailed information that is to be found in the numbers indicated in the explanatory notes below. An empty cell means either that there is no special provision and that only the general requirements apply, or that the carriage restriction indicated in the explanatory notes is in force.

The applicable general requirements are not referred to in the corresponding cells.

Explanatory notes for each column:

Column (1) “UN number/identification number”

Contains the UN number or identification number:

- of the dangerous substance if the substance has been assigned its own specific UN number or identification number, or
- of the generic or n.o.s. entry to which the dangerous substances not mentioned by name shall be assigned in accordance with the criteria (“decision trees”) of Part 2.

Column (2) “Name and description”

Contains, in upper case characters, the name of the substance, if the substance has been assigned its own specific UN number or identification number or of the generic or n.o.s. entry to which the dangerous substances have been assigned in accordance with the criteria (“decision trees”) of Part 2. This name shall be used as the proper shipping name or, when applicable, as part of the proper shipping name (see 3.1.2 for further details on the proper shipping name).

A descriptive text in lower case characters is added after the proper shipping name to clarify the scope of the entry if the classification or carriage conditions of the substance may be different under certain conditions.

Column (3a)	“Class” Contains the number of the Class, whose heading covers the dangerous substance. This Class number is assigned in accordance with the procedures and criteria of Part 2.
Column (3b)	“Classification code” Contains the classification code of the dangerous substance. – For dangerous substances of Class 2, the code consists of a number and one or more letters representing the hazardous property group, which are explained in 2.2.2.1.2 and 2.2.2.1.3. – For dangerous substances or articles of Classes 3, 4.1, 6.1, 8 and 9, the codes are explained in 2.2.x.1.2. ¹
Column (4)	“Packing group” Contains the packing group number(s) (I, II or III) assigned to the dangerous substance. These packing group numbers are assigned on the basis of the procedures and criteria of Part 2. Certain substances are not assigned to packing groups.
Column (5)	“Danger” This column contains information concerning the hazards inherent in the dangerous substance. These hazards are included on the basis of the danger labels of Table A, column (5). In the case of a chemically unstable substance, the code ‘unst.’ is added to the information. In the case of a substance or mixture hazardous to the aquatic environment, the code ‘N1’, ‘N2’ or ‘N3’ is added to the information. In the case of a substance or mixture with CMR properties, the code ‘CMR’ is added to the information. In the case of a substance or mixture that floats on the water surface, does not evaporate and is not readily soluble in water or that sinks to the bottom of the water and is not readily soluble, the code ‘F’ (standing for ‘Floater’) or ‘S’ (standing for ‘Sinker’), respectively, is added to the information.
Column (6)	“Type of tank vessel” Contains the type of tank vessel: G, C or N.
Column (7)	“Cargo tank design” Contains information concerning the design of the cargo tank: 1 Pressure cargo tank

¹ *x = the Class number of the dangerous substance or article, without dividing point if applicable.*

	2	Closed cargo tank
	3	Open cargo tank with flame arrester
	4	Open cargo tank
Column (8)		“Cargo tank type”
		Contains information concerning the cargo tank type.
	1	Independent cargo tank
	2	Integral cargo tank
	3	Cargo tank with walls distinct from the outer hull
Column (9)		“Cargo tank equipment”
		Contains information concerning the cargo tank equipment.
	1	Refrigeration system
	2	Possibility of cargo heating
	3	Water-spray system
	4	Cargo heating system on board
Column (10)		“Opening pressure of high-velocity vent valve in kPa”
		Contains information concerning the opening pressure of the high-velocity vent valve in kPa.
Column (11)		“Maximum degree of filling (%)”
		Contains information concerning the maximum degree of filling of cargo tanks as a percentage.
Column (12)		“Relative density”
		Contains information concerning the relative density of the substance at 20° C. Data concerning the density are for information only.
Column (13)		“Type of sampling device”
		Contains information concerning the prescribed type of sampling device.
	1	Closed sampling device
	2	Partly closed sampling device
	3	Open sampling device

Column (14)	“Pump-room below deck permitted” Contains an indication of whether a pump-room is permitted below deck. Yes pump-room below deck permitted No pump-room below deck not permitted
Column (15)	“Temperature class” Contains the temperature class of the substance.
Column (16)	“Explosion group” Contains the explosion group of the substance.
Column (17)	“Anti-explosion protection required” Contains a code referring to protection against explosions. Yes anti-explosion protection required No anti-explosion protection not required
Column (18)	“Equipment required” This column contains the alphanumeric codes for the equipment required for the carriage of the dangerous substance (see 8.1.5).
Column (19)	“Number of blue cones/lights” This column contains the number of cones/lights which should constitute the marking of the vessel during the carriage of this dangerous substance or article.
Column (20)	“Additional requirements/Remarks” This column contains the additional requirements or remarks applicable to the vessel. These additional requirements or remarks are: 1. Anhydrous ammonia is liable to cause stress crack corrosion in cargo tanks and cooling systems constructed of carbon-manganese steel or nickel steel. In order to minimize the risk of stress crack corrosion the following measures shall be taken: (a) Where carbon-manganese steel is used, cargo tanks, pressure vessels of cargo refrigeration systems and cargo piping shall be constructed of fine-grained steel having a specified minimum yield stress of not more than 355 N/mm ² . The actual yield stress shall not exceed 440 N/mm ² . In addition, one of the following construction or operational measures shall be taken:

- .1 Material with a low tensile strength ($R_m < 410 \text{ N/mm}^2$) shall be used; or
 - .2 Cargo tanks, etc., shall undergo a post-weld heat treatment for the purpose of stress relieving; or
 - .3 The transport temperature shall preferably be maintained close to the evaporation temperature of the cargo of -33°C , but in no case above -20°C ; or
 - .4 Ammonia shall contain not less than 0.1 % water, by mass.
- (b) When carbon-manganese steel with yield stress values higher than those referred to in (a) above is used, the completed tanks, pipe sections, etc., shall undergo a post-weld heat treatment for the purpose of stress relieving.
 - (c) Pressure vessels of the cargo refrigeration systems and the piping systems of the condenser of the cargo refrigeration system constructed of carbon-manganese steel or nickel steel shall undergo a post-weld heat treatment for the purpose of stress relieving.
 - (d) The yield stress and the tensile strength of welding consumables may exceed only by the smallest value possible the corresponding values of the tank and piping material.
 - (e) Nickel steels containing more than 5 % nickel and carbon-manganese steel which are not in compliance with the requirements of (a) and (b) above may not be used for cargo tanks and piping systems intended for the transport of this substance.
 - (f) Nickel steels containing not more than 5 % nickel may be used if the transport temperature is within the limits referred to in (a) above.

- (g) The concentration of oxygen dissolved in the ammonia shall not exceed the values given in the table below:

t in °C	O ₂ in %
-30 and below	0.90
-20	0.50
-10	0.28
0	0.16
10	0.10
20	0.05
30	0.03

2. Before loading, air shall be removed and subsequently kept away to a sufficient extent from the cargo tanks and the accessory cargo piping by the means of inert gas (see also 7.2.4.18).
3. Arrangements shall be made to ensure that the cargo is sufficiently stabilized in order to prevent a reaction at any time during carriage. The transport document shall contain the following additional particulars:
 - (a) Name and amount of inhibitor added;
 - (b) Date on which inhibitor was added and expected duration of effectiveness under normal conditions;
 - (c) Any temperature limits having an effect on the inhibitor.

When stabilization is ensured solely by blanketing with an inert gas it is sufficient to mention the name of the inert gas used in the transport document.

When stabilization is ensured by another measurement, e.g. the special purity of the substance, this measurement shall be mentioned in the transport document.

4. The substance shall not be allowed to solidify; the transport temperature shall be maintained above the melting point. In instances where cargo heating installations are required, they must be so designed that polymerisation through heating is not possible in any part of the cargo tank. Where the temperature of steam-heated coils could give rise to overheating, lower-temperature indirect heating systems shall be provided.
5. This substance is liable to clog the vapour pipe and its fittings. Careful surveillance should be ensured. If a close-type tank vessel is required for the carriage of this substance the vapour pipe shall conform to 9.3.2.22.5 (a) (i), (ii), (iv), (b), (c) or (d) or to 9.3.3.22.5 (a) (i), (ii), (iv), (b), (c) or (d). This requirement does not apply when the cargo tanks are inerted in accordance with 7.2.4.18 nor when protection against explosions is not required in column (17) and when flame-arresters have not been installed.

6. When external temperatures are below or equal to that indicated in column (20), the substance may only be carried in tank vessels equipped with a possibility of heating the cargo.

In addition, in the event of carriage in a closed-type vessel, if the tank vessel:

- is fitted out in accordance with 9.3.2.22.5 (a) (i) or (d) or 9.3.3.22.5 (a) (i) or (d), it shall be equipped with pressure/vacuum valves capable of being heated; or
- is fitted out in accordance with 9.3.2.22.5 (a) (ii), (v), (b) or (c) or 9.3.3.22.5 (a) (ii), (v), (b) or (c), it shall be equipped with heatable vapour pipes and heatable pressure/vacuum valves; or
- is fitted out in accordance with 9.3.2.22.5 (a) (iii) or (iv) or 9.3.3.22.5 (a) (iii) or (iv), it shall be equipped with heatable vapour pipes and with heatable pressure/vacuum valves and heatable flame-arresters.

The temperature of the vapour pipes, pressure/vacuum valves and flame-arresters shall be kept at least above the melting point of the substance.

7. If a closed-type tank vessel is required to carry this substance or if the substance is carried in a closed-type tank vessel, if this vessel:

- is fitted out in accordance with 9.3.2.22.5 (a) (i) or (d) or 9.3.3.22.5 (a) (i) or (d), it shall be equipped with heatable pressure/vacuum valves, or
- is fitted out in accordance with 9.3.2.22.5 (a) (ii), (v), (b) or (c) or 9.3.3.22.5 (a) (ii), (v), (b) or (c), it shall be equipped with heatable vapour pipes and heatable pressure/vacuum valves, or
- is fitted out in accordance with 9.3.2.22.5 (a) (iii) or (iv) or 9.3.3.22.5 (a) (iii) or (iv), it shall be equipped with heatable vapour pipes and with heatable pressure/vacuum valves and heatable flame-arresters.

The temperature of the vapour pipes, pressure/vacuum valves and flame-arresters shall be kept at least above the melting point of the substance.

8. Double-hull spaces, double bottoms and heating coils shall not contain any water.
9. (a) While the vessel is underway, an inert-gas pad shall be maintained in the ullage space above the liquid level.
- (b) Cargo piping and vent lines shall be independent of the corresponding piping used for other cargoes.
- (c) Safety valves shall be made of stainless steel.

10. *(Reserved)*
11. (a) Stainless steel of type 416 or 442 and cast iron shall not be used for cargo tanks and pipes for loading and unloading.
- (b) The cargo may be discharged only by deep-well pumps or pressure inert gas displacement. Each cargo pump shall be arranged to ensure that the substance does not heat significantly if the pressure discharge line from the pump is shut off or otherwise blocked.
- (c) The cargo shall be cooled and maintained at temperatures below 30° C.
- (d) The safety valves shall be set at a pressure of not less than 550 kPa (5.5 bar) gauge pressure. Special authorization is required for the maximum setting pressure.
- (e) While the vessel is underway, a nitrogen pad shall be maintained in the ullage space above the cargo (see also 7.2.4.18). An automatic nitrogen supply system shall be installed to prevent the pressure from falling below 7 kPa (0.07 bar) gauge within the cargo tank in the event of a cargo temperature fall due to ambient temperature conditions or to some other reason. In order to satisfy the demand of the automatic pressure control a sufficient amount of nitrogen shall be available on board. Nitrogen of a commercially pure quality of 99.9 %, by volume, shall be used for padding. A battery of nitrogen cylinders connected to the cargo tanks through a pressure reduction valve satisfies the intention of the expression “automatic” in this context.
- The required nitrogen pad shall be such that the nitrogen concentration in the vapour space of the cargo tank is not less than 45 % at any time.
- (f) Before loading and while the cargo tank contains this substance in a liquid or gaseous form, it shall be inerted with nitrogen.
- (g) The water-spray system shall be fitted with remote-control devices which can be operated from the wheelhouse or from the control station, if any.
- (h) Transfer arrangements shall be provided for emergency transfer of ethylene oxide in the event of an uncontrollable self-reaction.
12. (a) The substance shall be acetylene free.
- (b) Cargo tanks which have not undergone appropriate cleaning shall not be used for the carriage of these substances if one of the previous three cargoes consisted of a substance known to promote polymerisation, such as:

- .1 mineral acids (e.g. sulphuric acid, hydrochloric acid, nitric acid);
 - .2 carboxylic acids and anhydrides (e.g. formic acid, acetic acid);
 - .3 halogenated carboxylic acids (e.g. chloroacetic acid);
 - .4 sulphonic acids (e.g. benzene sulphonic acid);
 - .5 caustic alkalis (e.g. sodium hydroxide, potassium hydroxide);
 - .6 ammonia and ammonia solutions;
 - .7 amines and amine solutions;
 - .8 oxidizing substances.
- (c) Before loading, cargo tanks and their piping shall be efficiently and thoroughly cleaned so as to eliminate all traces of previous cargoes, except when the last cargo was constituted of propylene oxide or a mixture of ethylene oxide and propylene oxide. Special precautions shall be taken in the case of ammonia in cargo tanks built of steel other than stainless steel.
- (d) In all cases the efficiency of the cleaning of cargo tanks and their piping shall be monitored by means of appropriate tests or inspections to check that no trace of acid or alkaline substance remains that could present a danger in the presence of these substances.
- (e) The cargo tanks shall be entered and inspected prior to each loading of these substances to ensure freedom from contamination, heavy rust deposits or visible structural defects.
- When these cargo tanks are in continuous service for these substances, such inspections shall be performed at intervals of not more than two and a half years.
- (f) Cargo tanks which have contained these substances may be reused for other cargoes once they and their piping have been thoroughly cleaned by washing and flushing with an inert gas.
- (g) Substances shall be loaded and unloaded in such a way that there is no release of gas into the atmosphere. If gas is returned to the shore installation during loading, the gas return system connected to the tank containing that substance shall be independent from all other cargo tanks.
- (h) During discharge operations, the pressure in the cargo tanks shall be maintained above 7 kPa (0.07 bar) gauge.

- (i) The cargo shall be discharged only by deep-well pumps, hydraulically operated submerged pumps or pressure inert gas displacement. Each cargo pump shall be arranged to ensure that the substance does not heat significantly if the pressure discharge line from the pump is shut off or otherwise blocked.
- (j) Each cargo tank carrying these substances shall be ventilated by a system independent from the ventilation systems of other cargo tanks carrying other substances.
- (k) Loading pipes used for these substances shall be marked as follows:

“To be used only for the transfer of alkylene oxide.”

- (l) *(Reserved)*
- (m) No air shall be allowed to enter the cargo pumps and cargo piping system while these substances are contained within the system.
- (n) Before the shore connections are disconnected, piping containing liquids or gas shall be depressurised at the shore link by means of appropriate devices.
- (o) The piping system for cargo tanks to be loaded with these substances shall be separate from piping system for all other cargo tanks, including empty cargo tanks. If the piping system for the cargo tanks to be loaded is not independent, separation shall be accomplished by the removal of spool pieces, shut-off valves, other pipe sections and by fitting blank flanges at these locations. The required separation applies to all liquid pipes and vapour vent lines and any other connections which may exist such as common inert gas supply lines.
- (p) These substances may be carried only in accordance with cargo handling plans that have been approved by a competent authority.

Each loading arrangement shall be shown on a separate cargo handling plan. Cargo handling plans shall show the entire cargo piping system and the locations for installations of blank flanges needed to meet the above piping separation requirements. A copy of each cargo handling plan shall be kept on board. Reference to the approved cargo handling plans shall be included in the certificate of approval.

- (q) Before loading of these substances and before carriage is resumed a qualified person approved by the competent authority shall certify that the prescribed separation of the piping has been effected; this certificate shall be kept on board. Each connection between a blank flange and a shut-off valve in the piping shall be fitted with a sealed wire to prevent the flange from being disassembled inadvertently.

- (r) During the voyage, the cargo shall be covered with nitrogen. An automatic nitrogen make-up system shall be installed to prevent the cargo tank pressure from falling below 7 kPa (0.07 bar) gauge in the event of a cargo temperature fall due to ambient temperature conditions or to some other reason. Sufficient nitrogen shall be available on board to satisfy the demand of automatic pressure control. Nitrogen of commercially pure quality of 99.9 %, by volume, shall be used for padding. A battery of nitrogen cylinders connected to the cargo tanks through a pressure reduction valve satisfies the intention of the expression “automatic” in this context.
- (s) The vapour space of the cargo tanks shall be checked before and after each loading operation to ensure that the oxygen content is 2 %, by volume, or less.

- (t) Loading flow

The loading flow (L_R) of cargo tank shall not exceed the following value:

$$L_R = 3600 \times U/t \text{ (m}^3\text{/h)}$$

In this formula:

U = the free volume (m^3) during loading for the activation of the overflow prevention system;

T = the time (s) required between the activation of the overflow prevention system and the complete stop of the flow of cargo into the cargo tank;

The time is the sum of the partial times needed for successive operations, e.g. reaction time of the service personnel, the time needed to stop the pumps and the time needed to close the shut-off valves;

The loading flow shall also take account of the design pressure of the piping system.

13. If no stabilizer is supplied or if the supply is inadequate, the oxygen content in the vapour phase shall not exceed 0.1 %. Overpressure must be constantly maintained in cargo tanks. This requirement applies also to voyages on ballast or empty with uncleaned cargo tanks between cargo transport operations.
14. The following substances may not be carried under these conditions:
- substances with self-ignition temperatures ≤ 200 °C;
 - substances with a flash point < 23 °C and an explosion range > 15 percentage points;

- mixtures containing halogenated hydrocarbons;
 - mixtures containing more than 10 % benzene;
 - substances and mixtures carried in a stabilized state.
15. Provision shall be made to ensure that alkaline or acidic substances such as sodium hydroxide solution or sulphuric acid do not contaminate this cargo.
 16. If there is a possibility of a dangerous reaction such as polymerisation, decomposition, thermal instability or evolution of gases resulting from local overheating of the cargo in either the cargo tank or associated piping system, this cargo shall be loaded and carried adequately segregated from other substances the temperature of which is sufficiently high to initiate such reaction. Heating coils inside cargo tanks carrying this substance shall be blanked off or secured by equivalent means.
 17. The melting point of the cargo shall be shown in the transport documents.
 18. *(Reserved)*
 19. Provision shall be made to ensure that the cargo does not come into contact with water. The following additional requirements apply:

Carriage of the cargo is not permitted in cargo tanks adjacent to slop tanks or cargo tanks containing ballast water, slops or any other cargo containing water. Pumps, piping and vent lines connected to such tanks shall be separated from similar equipment of tanks carrying these substances. Pipes from slop tanks or ballast water pipes shall not pass through cargo tanks containing this cargo unless they are encased in a tunnel.
 20. The maximum permitted transport temperature given in column (20) shall not be exceeded.
 21. *(Reserved)*
 22. The relative density of the cargo shall be shown in the transport document.
 23. The instrument for measuring the pressure of the vapour phase in the cargo tank shall activate the alarm when the internal pressure reaches 40 kPa (0.4 bar). The water-spray system shall immediately be activated and remain in operation until the internal pressure drops to 30 kPa (0.3 bar).
 24. Substances having a flash-point above 61 °C which are handed over for carriage or which are carried heated within a limiting range of 15 K below their flash-point shall be carried under the conditions of substance number 9001.
 25. Type 3 cargo tank may be used for the carriage of this substance provided that the construction of the cargo tank has been accepted

by a recognized classification society for the maximum permitted transport temperature.

26. Type 2 cargo tank may be used for the carriage of this substance provided that the construction of the cargo tank has been accepted by a recognized classification society for the maximum permitted transport temperature.
27. The requirements of 3.1.2.8.1 are applicable.
28. (a) When UN 2448 SULPHUR, MOLTEN is carried, the forced ventilation of the cargo tanks shall be brought into service at latest when the concentration of hydrogen sulphide reaches 1.0 %, by volume.
(b) When during the carriage of UN 2448 SULPHUR, MOLTEN, the concentration of hydrogen sulphide exceeds 1.85 %, the boat master shall immediately notify the nearest competent authority.

When a significant increase in the concentration of hydrogen sulphide in a hold space leads it to be supposed that the sulphur has leaked, the cargo tanks shall be unloaded as rapidly as possible. A new load may only be taken on board once the authority which issued the certificate of approval has carried out a further inspection.

- (c) When UN 2448 SULPHUR, MOLTEN is carried, the concentration of hydrogen sulphide shall be measured in the vapour phase of the cargo tanks and concentrations of sulphur dioxide and hydrogen sulphide in the hold spaces.
 - (d) The measurements prescribed in (c) shall be made every eight hours. The results of the measurements shall be recorded in writing.
29. When particulars concerning the vapour pressure or the boiling point are given in column (2), the relevant information shall be added to the proper shipping name in the transport document, e.g.

UN 1224 KETONES, LIQUID, N.O.S.,
110 kPa < vp 50 ≤ 174 kPa or

UN 2929 TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.,
boiling point ≤ 60°C

30. When these substances are carried, the hold spaces of open type N tank vessels may contain auxiliary equipment.
31. When these substances are carried, the vessel shall be equipped with a rapid blocking valve placed directly on the shore connection.
32. In the case of transport of this substance, the following additional requirements are applicable:

- (a) The outside of the cargo tanks shall be equipped with insulation of low flammability. This insulation shall be strong enough to resist shocks and vibration. Above deck, the insulation shall be protected by a covering.

The outside temperature of this covering shall not exceed 70 °C.

- (b) The spaces containing the cargo tanks shall be provided with ventilation. Connections for forced ventilation shall be fitted.
- (c) The cargo tanks shall be equipped with forced ventilation installations which, in all transport conditions, will reliably keep the concentration of hydrogen sulphide above the liquid phase below 1.85 % by volume.

The ventilation installations shall be fitted in such a way as to prevent the deposit of the goods to be transported.

The exhaust line of the ventilation shall be fitted in such a way as not to present a risk to personnel.

- (d) The cargo tank and the hold spaces shall be fitted with outlets and piping to allow gas sampling.
- (e) The outlets of the cargo tanks shall be situated at a height such that for a trim of 2° and a list of 10°, no sulphur can escape. All the outlets shall be situated above the deck in the open air. Each outlet shall be equipped with a permanently fixed closing mechanism.

One of these mechanisms shall be capable of being opened for slight overpressure within the tank.

- (f) The pipes for loading and unloading shall be equipped with adequate insulation. They shall be capable of being heated.
- (g) The heat transfer fluid shall be such that in the event of a leak into a tank, there is no risk of a dangerous reaction with the sulphur.

33. The following provisions are applicable to transport of this substance:

Construction requirements:

- (a) Hydrogen peroxide solutions may be transported only in cargo tanks equipped with deep-well pumps.
- (b) Cargo tanks and their equipment shall be constructed of solid stainless steel of a type appropriate to hydrogen peroxide solutions (for example, 304, 304L, 316, 316L or 316 Ti). None of the non-metallic materials used for the system of cargo tanks shall be attacked by hydrogen peroxide solutions or cause the decomposition of the substance.

- (c) The temperature sensors shall be installed in the cargo tanks directly under the deck and at the bottom. Remote temperature read-outs and monitoring shall be provided for in the wheelhouse.
- (d) Fixed oxygen monitors (or gas-sampling lines) shall be provided in the areas adjacent to the cargo tanks so that leaks in such areas can be detected. Account shall be taken of the increased flammability arising from the increased presence of oxygen. Remote read-outs, continuous monitoring (if the sampling lines are used, intermittent monitoring will suffice) and visible and audible alarms similar to those for the temperature sensors shall also be located in the wheelhouse. The visible and audible alarms shall be activated if the oxygen concentration in these void spaces exceeds 30 % by volume. Two additional oxygen monitors shall also be available.
- (e) The cargo tank venting systems which are equipped with filters shall be fitted with pressure/vacuum relief valves appropriate to closed-circuit ventilation and with an extraction installation should cargo tank pressure rise rapidly as a result of an uncontrolled decomposition (see under m). These air supply and extraction systems shall be so designed that water cannot enter the cargo tanks. In designing the emergency extraction installation account shall be taken of the design pressure and the size of the cargo tanks.
- (f) A fixed water-spray system shall be provided for diluting and washing away any hydrogen peroxide solutions spilled onto the deck. The area covered by the jet of water shall include the shore connections and the deck containing the cargo tanks designated for carrying hydrogen peroxide solutions.

The following minimum requirements shall be complied with:

- .1 The substance shall be diluted from the original concentration to a 35 % concentration within five minutes from the spillage on the deck;
 - .2 The rate and estimated size of the spill shall be determined in the light of the maximum permissible loading or unloading rates, the time required to halt the spillage in the event of tank overflow or a piping/hose failure, and the time necessary to begin application of dilution water with actuation of the alarm at the cargo control location or in the wheelhouse.
- (g) The outlets of the pressure valves shall be situated at least 2 metres above the walkways if they are less than 4 metres from the walkway.

- (h) A temperature sensor shall be installed by each pump to make it possible to monitor the temperature of the cargo during unloading and detect any overheating due to defective operation of the pump.

Servicing requirements:

Carrier

- (i) Hydrogen peroxide solutions may only be carried in cargo tanks which have been thoroughly cleaned and passivated, in accordance with the procedure described under (j), of all traces of previous cargoes, their vapours or their ballast waters. A certificate stating that the procedure described under (j) has been duly complied with must be carried on board.

Particular care in this respect is essential to ensure the safe carriage of hydrogen peroxide solutions:

- .1 When a hydrogen peroxide solution is being carried, no other cargo may be carried simultaneously;
 - .2 Tanks which have contained hydrogen peroxide solutions may be reused for other cargoes after they have been cleaned by persons or companies approved for this purpose by the competent authority;
 - .3 In the design of the cargo tanks, efforts must be made to keep to a minimum any internal tank structure, to ensure free draining, no entrapment and ease of visual inspection.
- (j) Procedures for inspection, cleaning, passivation and loading for the transport of hydrogen peroxide solutions with a concentration of 8 to 60 per cent in cargo tanks which have previously carried other cargoes.

Before their reuse for the transport of hydrogen peroxide solutions, cargo tanks which have previously carried cargoes other than hydrogen peroxide must be inspected, cleaned and passivated. The procedures described in paragraphs .1 to .7 below for inspection and cleaning apply to stainless steel cargo tanks. The procedure for passivating stainless steel is described in paragraph .8. Failing any other instructions, all the measures apply to cargo tanks and to all their structures which have been in contact with other cargoes.

- .1 After unloading of the previous cargo, the cargo tank must be degassed and inspected for any remaining traces, carbon residues and rust.
- .2 The cargo tanks and their equipment must be washed with clear filtered water. The water used must be at least of the same quality as drinking water and have a low chlorine content.

- .3 Traces of the residues and vapours of the previous cargo must be removed by the steam cleaning of the cargo tanks and their equipment.
 - .4 The cargo tanks and their equipment must then be rewashed with clear water of the quality specified in paragraph 2 above and dried in filtered, oil-free air.
 - .5 Samples must be taken of the atmosphere in the cargo tanks and these must be analysed for their content of organic gases and oxygen.
 - .6 The cargo tank must be reinspected for any traces of the previous cargo, carbon residues or rust or odours of the previous cargo.
 - .7 If the inspection and the other measures point to the presence of traces of the previous cargo or of its gases, the measures described in paragraphs .2 to .4 above must be repeated.
 - .8 Stainless steel cargo tanks and their structures which have contained cargoes other than hydrogen peroxide solutions and which have been repaired must, regardless whether or not they have previously been passivated, be cleaned and passivated in accordance with the following procedure:
 - .8.1 The new weld seams and other repaired parts must be cleaned and scrubbed with stainless steel brushes, graving tools, sandpaper and polishers. Rough surfaces must be made smooth and a final polishing must be carried out;
 - .8.2 Fatty and oily residues must be removed with the use of organic solvents or appropriate cleaning products diluted with water. The use of chlorinated products shall be avoided because these might seriously interfere with the passivation procedure;
 - .8.3 Any residues that have been removed must be eliminated and the tanks must then be washed.
- (k) During the transfer of the hydrogen peroxide solutions, the related piping system must be separated from all other systems. Loading and unloading piping used for the transfer of hydrogen peroxide solutions must be marked as follows:
- “For Hydrogen Peroxide
Solution Transfer only”
- (l) If the temperature in the cargo tanks rises above 35 °C, visible and audible alarms shall activate in the wheelhouse.

Master

- (m) If the temperature rise exceeds 4 °C for 2 hours or if the temperature in the cargo tanks exceeds 40 °C, the master must contact the consignor directly, with a view to taking any action that might be necessary.

Filler

- (n) Hydrogen peroxide solutions must be stabilized to prevent decomposition. The manufacturer must provide a stabilization certificate which must be carried on board and must specify:
- .1 The disintegration date of the stabilizer and the duration of its effectiveness;
 - .2 Actions to be taken should the product become unstable during the voyage.
- (o) Only those hydrogen peroxide solutions which have a maximum decomposition rate of 1.0 per cent per year at 25 °C may be carried. A certificate from the filler stating that the product meets this standard must be presented to the master and kept on board. An authorized representative of the manufacturer must be on board to monitor the loading operations and to test the stability of the hydrogen peroxide solutions to be transported. He shall certify to the master that the cargo has been loaded in a stable condition.
34. For type N carriage, the flanges and stuffing boxes of the loading and unloading hoses must be fitted with a protection device to protect against splashing.
35. A direct system for the cargo refrigerating system is not permitted for this substance.
36. Only an indirect system for the cargo refrigerating system is permitted for this substance.
37. For this substance, the cargo tank system shall be capable of resisting the vapour pressure of the cargo at higher ambient temperatures whatever the system that has been adopted for treating the boil-off gas.
38. When the initial melting point of these mixtures in accordance with standard ASTM D86-01 is above 60° C, the transport requirements for packing group II are applicable.

UN No. or substance identification No.	(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1005	AMMONIA, ANHYDROUS	2	2TC			2.3+8+2.1	G	1	1	3		91		1	yes	T1	II A	yes	PP, EP, EX, TOX, A	2	1; 31
1010	1,2-BUTADIENE, STABILIZED	2	2F			2.1+unst.	G	1	1			91		1	yes	T2	II B ^{b)}	yes	PP, EX, A	1	2; 3; 31
1010	1,3-BUTADIENE, STABILIZED	2	2F			2.1+unst+CMR	G	1	1			91		1	yes	T2	II B	yes	PP, EX, A	1	2; 3; 31
1010	BUTADIENE STABILIZED or BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED, having a vapour pressure at 70 °C not exceeding 1.1 MPa (11 bar) and a density at 50 °C not lower than 0.525 kg/l	2	2F			2.1+unst.	G	1	1			91		1	yes	T2	II B	yes	PP, EX, A	1	2; 3; 31
1011	BUTANE	2	2F			2.1+CMR	G	1	1			91		1	yes	T2	II A	yes	PP, EX, A	1	31; 99
1012	1-BUTYLENE	2	2F			2.1	G	1	1			91		1	yes	T2	II A	yes	PP, EX, A	1	31
1020	CHLOROPENTAFLUOROETHANE (REFRIGERANT GAS R 115)	2	2A			2.2	G	1	1			91		1	yes			no	PP	0	31
1030	1,1-DIFLUOROETHANE (REFRIGERANT GAS R 152a)	2	2F			2.1	G	1	1			91		1	yes	T1	II A	yes	PP, EX, A	1	31
1033	DIMETHYL ETHER	2	2F			2.1	G	1	1			91		1	yes	T3	II B	yes	PP, EX, A	1	31
1038	ETHYLENE, REFRIGERATED LIQUID	2	3F			2.1	G	1	1	1		95		1	no	T1	II B	yes	PP, EX, A	1	31
1040	ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1 MPa (10 bar) at 50 °C	2	2TF			2.3+2.1	G	1	1			91		1	yes	T2	II B	yes	PP, EP, EX, TOX, A	2	2; 3; 11; 31
1055	ISOBUTYLENE	2	2F			2.1	G	1	1			91		1	yes	T2 ¹⁾	II A	yes	PP, EX, A	1	31
1063	METHYL CHLORIDE (REFRIGERANT GAS R 40)	2	2F			2.1	G	1	1			91		1	yes	T1	II A	yes	PP, EX, A	1	31
1077	PROPYLENE	2	2F			2.1	G	1	1			91		1	yes	T1	II A	yes	PP, EX, A	1	31

UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1083	TRIMETHYLAMINE, ANHYDROUS	2	2F		2.1	G	1	1			91		1	yes	T4	II A	yes	PP, EX, A	1	31
1086	VINYL CHLORIDE, STABILIZED	2	2F		2.1+unst.	G	1	1			91		1	yes	T2	II A	yes	PP, EX, A	1	2; 3; 13; 31
1088	ACETAL	3	F1	II	3	N	2	2		10	97	0.83	3	yes	T3	II B ^h	yes	PP, EX, A	1	
1089	ACETALDEHYDE (ethanal)	3	F1	I	3+N3	C	1	1			95	0.78	1	yes	T4	II A	yes	PP, EX, A	1	
1090	ACETONE	3	F1	II	3	N	2	2		10	97	0.79	3	yes	T1	II A	yes	PP, EX, A	1	
1092	ACROLEINE, STABILIZED	6.1	TF1	I	6.1+3+unst+N1	C	2	2	3	50	95	0.84	1	no	T3 ²⁾	II B	yes	PP, EP, EX, TOX, A	2	2; 3; 5; 23
1093	ACRYLONITRILE, STABILIZED	3	FT1	I	3+6.1+unst+N2+CMR	C	2	2	3	50	95	0.8	1	no	T1	II B	yes	PP, EP, EX, TOX, A	2	3; 5; 23
1098	ALLYL ALCOHOL	6.1	TF1	I	6.1+3+N1	C	2	2		40	95	0.85	1	no	T2	II B	yes	PP, EP, EX, TOX, A	2	
1100	ALLYL CHLORIDE	3	FT1	I	3+6.1+N1	C	2	2	3	50	95	0.94	1	no	T2	II A	yes	PP, EP, EX, TOX, A	2	23
1105	PENTANOLS (n- PENTANOL)	3	F1	III	3	N	3	2			97	0.81	3	yes	T2	II A	yes	PP, EX, A	0	
1106	AMYLAMINE (n-AMYLAMINE)	3	FC	II	3+8	C	2	2		40	95	0.76	2	yes	T4 ³⁾	II A ⁷⁾	yes	PP, EP, EX, A	1	
1107	AMYL CHLORIDES (1-CHLOROPENTANE)	3	F1	II	3	C	2	2		40	95	0.88	2	yes	T3	II A	yes	PP, EX, A	1	
1107	AMYL CHLORIDES (1-CHLORO-3-METHYLBUTANE)	3	F1	II	3	C	2	2		45	95	0.89	2	yes	T3	II A	yes	PP, EX, A	1	
1107	AMYL CHLORIDES (2-CHLORO-2-METHYLBUTANE)	3	F1	II	3	C	2	2		50	95	0.87	2	yes	T2	II A	yes	PP, EX, A	1	
1107	AMYL CHLORIDES (1-CHLORO-2,2-DIMETHYLPROPANE)	3	F1	II	3	C	2	2		50	95	0.87	2	yes	T3 ²⁾	II A	yes	PP, EX, A	1	
1107	AMYL CHLORIDES	3	F1	II	3	C	1	1			95	0.9	1	yes	T3 ²⁾	II A	yes	PP, EX, A	1	27

UN No. or substance identification No.	(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks		
1108	1-PENTENE (n-AMYLENE)	3	F1	I	3+N3	N	1	1		97	0.64	1	yes	T3	II B ¹⁾	yes	PP, EX, A	1			
1114	BENZENE	3	F1	II	3+N3+CMR	C	2	3	50	95	0.88	2	yes	T1	II A	yes	PP, EP, EX, TOX, A	1	6; +10 °C; 17; 23		
1120	BUTANOLS (tert- BUTYLALCOHOL)	3	F1	II	3	N	2	2	10	97	0.79	3	yes	T1	II A ⁷⁾	yes	PP, EX, A	1	7; 17		
1120	BUTANOLS (sec-BUTYLALCOHOL)	3	F1	III	3	N	3	2		97	0.81	3	yes	T2	II B ⁷⁾	yes	PP, EX, A	0			
1120	BUTANOLS (n- BUTYL ALCOHOL)	3	F1	III	3	N	3	2		97	0.81	3	yes	T2	II B	yes	PP, EX, A	0			
1123	BUTYL ACETATES (sec-BUTYLACETATE)	3	F1	II	3	N	2	2	10	97	0.86	3	yes	T2	II A ⁷⁾	yes	PP, EX, A	1			
1123	BUTYL ACETATES (n-BUTYL ACETATE)	3	F1	III	3+N3	N	3	2		97	0.86	3	yes	T2	II A	yes	PP, EX, A	0			
1125	n-BUTYLAMINE	3	FC	II	3+8+N3	C	2	3	50	95	0.75	2	yes	T2	II A	yes	PP, EP, EX, A	1	23		
1127	CHLOROBUTANES (1-CHLOROBUTANE)	3	F1	II	3	C	2	2	50	95	0.89	2	yes	T3	II A	yes	PP, EX, A	1	23		
1127	CHLOROBUTANES (2-CHLOROBUTANE)	3	F1	II	3	C	2	3	50	95	0.87	2	yes	T4 ³⁾	II A	yes	PP, EX, A	1	23		
1127	CHLOROBUTANES (1-CHLORO-2-METHYLPROPANE)	3	F1	II	3	C	2	3	50	95	0.88	2	yes	T4 ³⁾	II A	yes	PP, EX, A	1	23		
1127	CHLOROBUTANES (2-CHLORO-2-METHYLPROPANE)	3	F1	II	3	C	2	3	50	95	0.84	2	yes	T1	II A	yes	PP, EX, A	1	23		
1127	CHLOROBUTANES	3	F1	II	3	C	1	1		95	0.89	1	yes	T4 ³⁾	II A	yes	PP, EX, A	1	27		
1129	BUTYRALDEHYDE (n-BUTYRALDEHYDE)	3	F1	II	3+N3	C	2	3	50	95	0.8	2	yes	T4	II A	yes	PP, EX, A	1	15; 23		
1131	CARBON DISULPHIDE	3	FT1	I	3+6.1+N2	C	2	3	50	95	1.26	1	no	T6	II C	yes	PP, EP, EX, TOX, A	2	2; 9; 23		

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1134	CHLOROBENZENE (phenyl chloride)	3	F1	III	3+N2+S	C	2	2		30	95	1.11	2	yes	T1	II A ⁸⁾	yes	PP, EX, A	0	
1135	ETHYLENE CHLOROXYDRIN (2-CHLOROETHANOL)	6.1	TF1	I	6.1+3	C	2	2		30	95	1.21	1	no	T2	II A ⁸⁾	yes	PP, EP, EX, TOX, A	2	
1143	CROTONALDEHYDE, STABILIZED	6.1	TF1	I	6.1+3+unst.+NI	C	2	2		40	95	0.85	1	no	T3	II B	yes	PP, EP, EX, TOX, A	2	3; 5; 15
1145	CYCLOHEXANE	3	F1	II	3+NI	C	2	2	3	50	95	0.78	2	yes	T3	II A	yes	PP, EX, A	1	6; +11 °C; 17
1146	CYCLOPENTANE	3	F1	II	3+N2	N	2	3		10	97	0.75	3	yes	T2	II A	yes	PP, EX, A	1	
1150	1,2-DICHLOROETHYLENE (cis-1,2-DICHLOROETHYLENE)	3	F1	II	3+N2	C	2	2	3	50	95	1.28	2	yes	T2 ¹⁾	II A	yes	PP, EX, A	1	23
1150	1,2-DICHLOROETHYLENE (trans-1,2-DICHLOROETHYLENE)	3	F1	II	3+N2	C	2	2	3	50	95	1.26	2	yes	T2	II A	yes	PP, EX, A	1	23
1153	ETHYLENE GLYCOL DIETHYL ETHER	3	F1	III	3	N	3	2			97	0.84	3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	
1154	DIETHYLAMINE	3	FC	II	3+8+N3	C	2	2	3	50	95	0.7	2	yes	T2	II A	yes	PP, EP, EX, A	1	23
1155	DIETHYL ETHER	3	F1	I	3	C	1	1			95	0.71	1	yes	T4	II B	yes	PP, EX, A	1	
1157	DIISOBUTYL KETONE	3	F1	III	3+N3+F	N	3	3			97	0.81	3	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	
1159	DIISOPROPYL ETHER	3	F1	II	3+N2	C	2	2	3	50	95	0.72	2	yes	T2	II A	yes	PP, EX, A	1	
1160	DIMETHYLAMINE AQUEOUS SOLUTION	3	FC	II	3+8	C	2	2	3	50	95	0.82	2	yes	T2	II B ⁴⁾	yes	PP, EP, EX, A	1	23
1163	DIMETHYLHYDRAZINE, UNSYMMETRICAL	6.1	TFC	I	6.1+3+8+N2+CMR	C	2	2	3	50	95	0.78	1	no	T3	II B ⁴⁾	yes	PP, EP, EX, TOX, A	2	23
1165	DIOXANE	3	F1	II	3	N	2	2		10	97	1.03	3	yes	T2	II B	yes	PP, EX, A	1	6; +14 °C; 17
1167	DIVINYLETHER, STABILIZED	3	F1	I	3+unst.	C	1	1			95	0.77	1	yes	T2	II B ⁷⁾	yes	PP, EX, A	1	2; 3

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1170	ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION), aqueous solution with more than 70 % alcohol by volume	3	F1	II	3	N	2	2		10	97	0,79 - 0,87	3	yes	T2	II B	yes	PP, EX, A	1	
1170	ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION), aqueous solution with more than 24 % and not more than 70 % alcohol by volume	3	F1	III	3	N	3	2			97	0,87 - 0,96	3	yes	T2	II B	yes	PP, EX, A	0	
1171	ETHYLENE GLYCOL MONOETHYL ETHER	3	F1	III	3+CMR	N	2	3	3	10	97	0,93	3	yes	T3	II B	yes	PP, EX, A	0	
1172	ETHYLENE GLYCOL MONOETHYL ETHER ACETATE	3	F1	III	3+N3+CMR	N	2	3	3	10	97	0,98	3	yes	T2	II A	yes	PP, EX, A	0	
1173	ETHYL ACETATE	3	F1	II	3	N	2	2		10	97	0,9	3	yes	T1	II A	yes	PP, EX, A	1	
1175	ETHYLBENZENE	3	F1	II	3+N3	N	2	2		10	97	0,87	3	yes	T2	II B	yes	PP, EX, A	1	
1177	2-ETHYLBUTYL ACETATE	3	F1	III	3	N	3	2			97	0,88	3	yes	T3	II A	yes	PP, EX, A	0	
1179	ETHYL BUTYL ETHER (ETHYL tert-BUTYL ETHER)	3	F1	II	3+N3	N	2	2		10	97	0,74	3	yes	T2	II B	yes	PP, EX, A	1	
1184	ETHYLENE DICHLORIDE (1,2-dichloroethane)	3	FT1	II	3+6.1+CMR	C	2	2		50	95	1,25	2	no	T2	II A	yes	PP, EP, EX, TOX, A	2	
1188	ETHYLENE GLYCOL MONOMETHYL ETHER	3	F1	III	3+CMR	N	2	3	3	10	97	0,97	3	yes	T3	II B	yes	PP, EX, A	0	
1191	OCTYL ALDEHYDES (2-ETHYLCAPRONALDEHYDE)	3	F1	III	3+F	C	2	2		30	95	0,82	2	yes	T4	II A	yes	PP, EX, A	0	
1191	OCTYL ALDEHYDES (n-OCTALDEHYDE)	3	F1	III	3+N3+F	N	3	3			97	0,82	3	yes	T3	II B ^{d)}	yes	PP, EX, A	0	
1193	ETHYL METHYL KETONE (METHYL ETHYL KETONE)	3	F1	II	3	N	2	2		10	97	0,8	3	yes	T1	II A	yes	PP, EX, A	1	
1198	FORMALDEHYDE SOLUTION, FLAMMABLE	3	FC	III	3+8+N3	N	3	2			97	1,09	3	yes	T2	II B	yes	PP, EP, EX, A	0	34

UN No. or substance identification No.	(1)	Name and description	(2)	Class	(3a)	Classification code	(3b)	Packing group	(4)	Dangers	(5)	Type of tank vessel	(6)	Cargo tank design	(7)	Cargo tank type	(8)	Cargo tank equipment	(9)	Opening pressure of the high-velocity vent valve in kPa	(10)	Maximum degree of filling in %	(11)	Relative density at 20 °C	(12)	Type of sampling device	(13)	Pump room below deck permitted	(14)	Temperature class	(15)	Explosion group	(16)	Anti-explosion protection required	(17)	Equipment required	(18)	Number of cones/blue lights	(19)	Additional requirements/Remarks	(20)
1199		FURALDEHYDES (a-FURALDEHYDE) or FURFURALDEHYDES (a-FURFURYLALDEHYDE)		6.1	TF1	II		II		6.1+3		C	2	2		2					25	95	1.16	2	no	T3 ²⁾	II B	yes	PP, EP, EX, TOX, A	2	15										
1202		GAS OIL or DIESEL FUEL or HEATING OIL (LIGHT) (flash-point not more than 60 °C)		3	F1	III		III		3+(N1, N2, N3, CMR, F or S)	*	*	*								*	*	< 0,85	*				yes				no	PP	0	*see flowchart						
1202		GAS OIL complying with standard EN 590: 2004 or DIESEL FUEL or HEATING OIL (LIGHT) with flash-point as specified in EN 590:2004		3	F1	III		III		3+N2+F		N	4	3									97	0,82 - 0,85	3	yes						no	PP	0							
1202		GAS OIL or DIESEL FUEL or HEATING OIL (LIGHT) (flash-point more than 60 °C but not more than 100 °C)		3	F1	III		III		3+(N1, N2, N3, CMR, F or S)	*	*	*									*	*	< 1,1	*				yes				no	PP	0	*see flowchart					
1203		MOTOR SPIRIT or GASOLINE or PETROL		3	F1	II		II		3+N2+CMR+F		N	2	3								10	97	0,68 - 0,72 ¹⁰⁾	3	yes	T3	II A	yes	PP, EX, A	1	1									
1203		MOTOR SPIRIT or GASOLINE or PETROL, WITH MORE THAN 10 % BENZENE BOILING POINT ≤ 60 °C		3	F1	II		II		3+CMR+F		C	1	1									95		1	yes	T3	II A	yes	PP, EX, A	1	29									
1203		MOTOR SPIRIT or GASOLINE or PETROL WITH MORE THAN 10 % BENZENE 60 °C < BOILING POINT ≤ 85 °C		3	F1	II		II		3+CMR+F		C	2	2								50	95		2	yes	T3	II A	yes	PP, EX, A	1	23; 29									
1203		MOTOR SPIRIT or GASOLINE or PETROL WITH MORE THAN 10 % BENZENE 85 °C < BOILING POINT ≤ 115 °C		3	F1	II		II		3+CMR+F		C	2	2								50	95		2	yes	T3	II A	yes	PP, EX, A	1	29									
1203		MOTOR SPIRIT or GASOLINE or PETROL WITH MORE THAN 10 % BENZENE BOILING POINT > 115 °C		3	F1	II		II		3+CMR+F		C	2	2								35	95		2	yes	T3	II A	yes	PP, EX, A	1	29									

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
1206	HEPTANES (n-HEPTANE)	3	F1	II	3+N1	C	2	2	3	50	95	0.68	2	yes	T3	II A	yes	PP, EX, A	1	
1208	HEXANES (n-HEXANE)	3	F1	II	3+N1	C	2	2	3	50	95	0.66	2	yes	T3	II A	yes	PP, EX, A	1	
1212	ISOBUTANOL or ISOBUTYL ALCOHOL	3	F1	III	3	N	3	2			97	0.8	3	yes	T2	II A	yes	PP, EX, A	0	
1213	ISOBUTYLACETATE	3	F1	II	3+N3	N	2	2		10	97	0.87	3	yes	T2	II A ⁷⁾	yes	PP, EX, A	1	
1214	ISOBUTYLAMINE	3	FC	II	3+8	C	2	2	3	50	95	0.73	2	yes	T2	II A	yes	PP, EP, EX, A	1	23
1216	ISOOCTENES	3	F1	II	3+N2	N	2	3		10	97	0.73	3	yes	T3	II B ⁴⁾	yes	PP, EX, A	1	
1218	ISOPRENE, STABILIZED	3	F1	I	3+unst.+N2+CMR	N	1	1			95	0.68	1	yes	T3	II B	yes	PP, EX, A	1	2; 3; 5; 16
1219	ISOPROPANOL or ISOPROPYL ALCOHOL	3	F1	II	3	N	2	2		10	97	0.78	3	yes	T2	II A	yes	PP, EX, A	1	
1220	ISOPROPYLE ACETATE	3	F1	II	3	N	2	2		10	97	0.88	3	yes	T2	II A	yes	PP, EX, A	1	
1221	ISOPROPYLAMINE	3	FC	I	3+8+N3	C	1	1			95	0.69	1	yes	T2	II A ⁷⁾	yes	PP, EP, EX, A	1	
1223	KEROSENE	3	F1	III	3+N2+F	N	3	3			97	≤0,83	3	yes	T3	II A	yes	PP, EX, A	0	14
1224	KETONES, LIQUID, N.O.S.	3	F1	II	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14; 27; 29 *see flowchart
1224	KETONES, LIQUID, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14; 27 *see flowchart
1229	MESITYL OXYDE	3	F1	III	3	N	3	2			97	0.85	3	yes	T2	II B ⁴⁾	yes	PP, EX, A	0	
1230	METHANOL	3	FT1	II	3+6.1	N	2	2	3	50	95	0.79	2	yes	T2	II A	yes	PP, EP, EX, TOX, A	1	23
1231	METHYL ACETATE	3	F1	II	3	N	2	2		10	97	0.93	3	yes	T1	II A	yes	PP, EX, A	1	
1235	METHYLAMINE, AQUEOUS SOLUTION	3	FC	II	3+8	C	2	2		50	95		2	yes	T2	II A	yes	PP, EP, EX, A	1	
1243	METHYL FORMATE	3	F1	I	3	C	1	1			95	0.97	1	yes	T2	II A	yes	PP, EX, A	1	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1244	METHYLHYDRAZINE	6.1	TFC	I	6.1+3+8	C	2	2		45	95	0.88	1	no	T4	II C ³⁾	yes	PP, EP, EX, TOX, A	2	
1245	METHYL ISOBUTYL KETONE	3	F1	II	3	N	2	2		10	97	0.8	3	yes	T1	II A	yes	PP, EX, A	1	
1247	METHYL METHACRYLATE MONOMER, STABILIZED	3	F1	II	3+unst.	C	2	2		40	95	0.94	1	yes	T2	II A	yes	PP, EX, A	1	3; 5; 16
1262	OCTANES (n-OCTANE)	3	F1	II	3+N1	C	2	2		45	95	0.7	2	yes	T3	II A	yes	PP, EX, A	1	
1264	PARALDEHYDE	3	F1	III	3	N	3	2			97	0.99	3	yes	T3	II A ⁷⁾	yes	PP, EX, A	0	6; +16 °C; 17
1265	PENTANES, liquid (2- METHYLBUTANE)	3	F1	I	3+N2	N	1	1			97	0.62	1	yes	T2	II A	yes	PP, EX, A	1	
1265	PENTANES, liquid (n-PENTANE)	3	F1	II	3+N2	N	2	3		50	97	0.63	3	yes	T3	II A	yes	PP, EX, A	1	
1265	PENTANES, liquid (n-PENTANE)	3	F1	II	3+N2	N	2	3	3	10	97	0.63	3	yes	T3	II A	yes	PP, EX, A	1	
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10 % BENZENE vp50 > 175 kPa	3	F1	I	3+CMR+F	C	1	1			95		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	29
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10 % BENZENE 110 kPa < vp50 ≤ 175 kPa	3	F1	II	3+CMR+F	C	1	1			95		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	29
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa BOILING POINT ≤ 60 °C	3	F1	I	3+CMR+F	C	1	1			95		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	29
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa BOILING POINT ≤ 60 °C	3	F1	I	3+CMR+F	C	2	2	3	50	95		2	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	23; 29
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa BOILING POINT ≤ 60 °C	3	F1	II	3+CMR+F	C	1	1			95		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	29

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa BOILING POINT ≤ 60 °C	3	F1	II	3+CMR+F	C	2	2	3	50	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	23; 29; 38
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa 60 °C < BOILING POINT ≤ 85 °C	3	F1	II	3+CMR+F	C	2	2	3	50	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	23; 29
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa 85 °C < BOILING POINT ≤ 115 °C	3	F1	II	3+CMR+F	C	2	2		50	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	29
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa BOILING POINT > 115 °C	3	F1	II	3+CMR+F	C	2	2		35	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	29
1267	PETROLEUM CRUDE OIL	3	F1	I	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	14; 29; *see flowchart
1267	PETROLEUM CRUDE OIL	3	F1	II	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	14; 29; *see flowchart
1267	PETROLEUM CRUDE OIL	3	F1	III	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	0	14; *see flowchart
1268	PETROLEUM DISTILLATES, N.O.S. WITH MORE THAN 10 % BENZENE or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10 % BENZENE vp50 > 175 kPa	3	F1	I	3+CMR+F	C	1	1			95		1	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	27; 29

UN No. or substance identification No.	(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1268		PETROLEUM DISTILLATES, N.O.S. WITH MORE THAN 10 % BENZENE or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10 % BENZENE, vp50 ≤ 110 kPa BOILING POINT ≤ 60 °C	3	F1	II	3+CMR+F	C	2	2	3	50	95	0.765	2	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	23; 27; 29
1268		PETROLEUM DISTILLATES, N.O.S. WITH MORE THAN 10 % BENZENE or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10 % BENZENE, vp50 ≤ 110 kPa 60 °C < BOILING POINT ≤ 85 °C	3	F1	II	3+CMR+F	C	2	2	3	50	95		2	yes	T 3	II A	yes	PP, EX, A	1	23; 27; 29
1268		PETROLEUM DISTILLATES, N.O.S. WITH MORE THAN 10 % BENZENE or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10 % BENZENE, vp50 ≤ 110 kPa 85 °C < BOILING POINT ≤ 115 °C	3	F1	II	3+CMR+F	C	2	2		50	95		2	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	27; 29
1268		PETROLEUM DISTILLATES, N.O.S. WITH MORE THAN 10 % BENZENE or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10 % BENZENE, vp50 ≤ 110 kPa BOILING POINT > 115 °C	3	F1	II	3+CMR+F	C	2	2		35	95		2	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	27; 29
1268		PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. (NAPHTHA) 110 kPa < vp50 ≤ 175 kPa	3	F1	II	3+N2+CMR+F	N	2	3	3	10	97	0.735	3	yes	T3	II A	yes	PP, EX, A	1	14; 27; 29

(1)	(2)	(3a)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	
UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. (NAPHTHA) 110 kPa < vp50 ≤ 150 kPa	3	F1	II	3+N2+CMR+ F	N	2	3	3	10	97	0.735	3	yes	T3	II A	yes	PP, EX, A	1	14; 29
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. (NAPHTHA) vp50 ≤ 110 kPa	3	F1	II	3+N2+CMR+ F	N	2	3		10	97	0.735	3	yes	T3	II A	yes	PP, EX, A	1	14; 29
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. (BENZENE HEART CUT) vp50 ≤ 110 kPa	3	F1	II	3+N2+ CMR+F	N	2	3		10	97	0.765	3	yes	T3	II A	yes	PP, EX, A	1	14; 29
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S.	3	F1	I	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	14; 27; 29 *see flowchart
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S.	3	F1	II	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	14; 27; 29 *see flowchart
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	0	14; 27 *see flowchart
1274	n-PROPANOL or PROPYL ALCOHOL, NORMAL	3	F1	II	3	N	2	2		10	97	0.8	3	yes	T2	II B	yes	PP, EX, A	1	
1274	n-PROPANOL or PROPYL ALCOHOL, NORMAL	3	F1	III	3	N	3	2			97	0.8	3	yes	T2	II B	yes	PP, EX, A	0	
1275	PROPIONALDEHYDE	3	F1	II	3+N3	C	2	2	3	50	95	0.81	2	yes	T4	II B	yes	PP, EX, A	1	15; 23
1276	n-PROPYL ACETATE	3	F1	II	3+N3	N	2	2		10	97	0.88	3	yes	T1	II A	yes	PP, EX, A	1	
1277	PROPYLAMINE (1-aminopropane)	3	FC	II	3+8	C	2	2	3	50	95	0.72	2	yes	T3 ⁽²⁾	II A	yes	PP, EP, EX, A	1	23

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
1278	1-CHLOROPROPANE (propyl chloride)	3	F1	II	3	C	2	2	3	50	95	0.89	2	yes	T1	II A	yes	PP, EX, A	1	23
1279	1,2-DICHLOROPROPANE or PROPYL DICHLORIDE	3	F1	II	3+N2	C	2	2		45	95	1.16	2	yes	T1	II A ⁸⁾	yes	PP, EX, A	1	
1280	PROPYLENE OXIDE	3	F1	I	3+unst.+N3+CMR	C	1	1			95	0.83	1	yes	T2	II B	yes	PP, EX, A	1	2; 12; 31
1282	PYRIDINE	3	F1	II	3+N3	N	2	2		10	97	0.98	3	yes	T1	II A ⁸⁾	yes	PP, EX, A	1	
1289	SODIUM METHYLATE SOLUTION in alcohol	3	FC	III	3+8	N	3	2			97	0.969	3	yes	T2	II A	yes	PP, EP, EX, A	0	34
1294	TOLUENE	3	F1	II	3+N3	N	2	2		10	97	0.87	3	yes	T1	II A ⁸⁾	yes	PP, EX, A	1	
1296	TRIETHYLAMINE	3	FC	II	3+8+N3	C	2	2		50	95	0.73	2	yes	T3	II A ⁸⁾	yes	PP, EP, EX, A	1	
1300	TURPENTINE SUBSTITUTE	3	F1	III	3+N2+F	N	3	3			97	0.78	3	yes	T3	II B ⁹⁾	yes	PP, EX, A	0	
1301	VINYL ACETATE, STABILIZED	3	F1	II	3+unst.+N3	N	2	2		10	97	0.93	2	yes	T2	II A	yes	PP, EX, A	1	3; 5; 16
1307	XYLENES (o- XYLENE)	3	F1	III	3+N2	N	3	3			97	0.88	3	yes	T1	II A	yes	PP, EX, A	0	
1307	XYLENES (m- XYLENE)	3	F1	III	3+N2	N	3	3			97	0.86	3	yes	T1	II A	yes	PP, EX, A	0	
1307	XYLENES (p- XYLENE)	3	F1	III	3+N2	N	3	3	2		97	0.86	3	yes	T1	II A	yes	PP, EX, A	0	6; +17 °C; 17
1307	XYLENES (mixture with melting point ≤ 0° C)	3	F1	II	3+N2	N	3	3			97		3	yes	T1	II A	yes	PP, EX, A	1	
1307	XYLENES (mixture with melting point ≤ 0° C)	3	F1	III	3+N2	N	3	3			97		3	yes	T1	II A	yes	PP, EX, A	0	
1307	XYLENES (mixture with 0° C < melting point < 13° C)	3	F1	III	3+N2	N	3	3	2		97		3	yes	T1	II A	yes	PP, EX, A	0	6; +17 °C; 17
1541	ACETONE CYANOHYDRIN, STABILIZED	6.1	T1	I	6.1+unst.+N1	C	2	2		50	95	0.932	1	no			no	PP, EP, TOX, A	2	3
1545	ALLYL ISOTHIOCYANATE, STABILIZED	6.1	TF1	II	6.1+3+unst.	C	2	2		30	95	1.02	1	no	T4 ³⁾	II B ⁴⁾	yes	PP, EP, EX, TOX, A	2	2; 3

UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1547	ANILINE	6.1	T1	II	6.1+N1	C	2	2		25	95	1.02	2	no			no	PP, EP, TOX, A	2	
1578	CHLORONITROBENZENES, SOLID, MOLTEN (p-CHLORONITROBENZENE)	6.1	T2	II	6.1+N2+S	C	2	1	2	25	95	1.37	2	no	T4 ³⁾	II B ¹⁾	yes	PP, EP, EX, TOX, A	2	7; 17; 26
1578	CHLORONITROBENZENES, SOLID, MOLTEN (p-CHLORONITROBENZENE)	6.1	T2	II	6.1+N2+S	C	2	1	4	25	95	1.37	2	no			no	PP, EP, TOX, A	2	7; 17; 20; +112 °C; 26
1591	o-DICHLOROBENZENE	6.1	T1	III	6.1+N1+S	C	2	2		25	95	1.32	2	no			no	PP, EP, TOX, A	0	
1593	DICHLOROMETHANE (methyl chloride)	6.1	T1	III	6.1	C	2	2	3	50	95	1.33	2	no			no	PP, EP, TOX, A	0	23
1594	DIETHYL SULPHATE	6.1	T1	II	6.1+N2 +CMR	C	2	2		25	95	1.18	2	no			no	PP, EP, TOX, A	2	
1595	DIMETHYL SULPHATE	6.1	TC1	I	6.1+8+N3+CMR	C	2	2		25	95	1.33	2	no			no	PP, EP, TOX, A	2	
1604	ETHYLENEDIAMINE	8	CF1	II	8+3+N3	N	3	2			97	0.9	3	yes	T2	II A	yes	PP, EP, EX, A	1	6; +12 °C; 17; 34
1605	ETHYLENE DIBROMIDE	6.1	T1	I	6.1+N2 +CMR	C	2	2		30	95	2.18	1	no			no	PP, EP, TOX, A	2	6; +14 °C; 17
1648	ACETONITRILE (methyl cyanide)	3	F1	II	3	N	2	2		10	97	0.78	3	yes	T1	II A	yes	PP, EX, A	1	
1662	NITROBENZENE	6.1	T1	II	6.1+N2	C	2	2	2	25	95	1.21	2	no	T1	II B	yes	PP, EP, EX, TOX, A	2	6; +10°C; 17
1663	NITROPHENOLS	6.1	T2	III	6.1+N3+S	C	2	2	2	25	95		2	no	T1	II B ¹⁾	yes	PP, EP, EX, TOX, A	0	7; 17
1663	NITROPHENOLS	6.1	T2	III	6.1+N3+S	C	2	2	4	25	95		2	no			no	PP, EP, TOX, A	0	7; 17; 20; +65 °C
1664	NITROTOLUENES, LIQUID (o-NITROTOLUENE)	6.1	T1	II	6.1+N2 +CMR+S	C	2	2		25	95	1.16	2	no			no	PP, EP, TOX, A	2	17

UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1708	TOLUIDINES, LIQUID (o-TOLUIDINE)	6.1	T1	II	6.1+N1	C	2	2		25	95	1	2	no			no	PP, EP, TOX, A	2	
1708	TOLUIDINES, LIQUID (m-TOLUIDINE)	6.1	T1	II	6.1+N1 +CMR	C	2	2		25	95	1.03	2	no			no	PP, EP, TOX, A	2	
1710	TRICHLOROETHYLENE	6.1	T1	III	6.1+N2 +CMR	C	2	2		50	95	1.46	2	no			no	PP, EP, TOX, A	0	15
1715	ACETIC ANHYDRIDE	8	CF1	II	8+3	N	2	3		10	97	1.08	3	yes	T2	II A	yes	PP, EP, EX, A	1	34
1717	ACETYL CHLORIDE	3	FC	II	3+8	C	2	2	3	50	95	1.1	2	yes	T2	II A ⁸⁾	yes	PP, EP, EX, A	1	23
1718	BUTYL ACIDE PHOSPHATE	8	C3	III	8+N3	N	4	3			97	0.98	3	yes			no	PP, EP	0	34
1719	CAUSTIC ALKALI LIQUID, N.O.S.	8	C5	II	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP, EP	0	27; 30; 34 *see flowchart
1719	CAUSTIC ALKALI LIQUID, N.O.S.	8	C5	III	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP, EP	0	27; 30; 34 *see flowchart
1738	BENZYL CHLORIDE	6.1	TC1	II	6.1+8+3+N3+CMR+S	C	2	2		25	95	1.1	2	no	T1	II A ⁸⁾	yes	PP, EP, EX, TOX, A	2	
1742	BORON TRIFLUORIDE ACETIC ACID COMPLEX, LIQUID	8	C3	II	8	N	4	2			97	1.35	3	yes			no	PP, EP	0	34
1750	CHLORACETIC ACID SOLUTION	6.1	TC1	II	6.1+8+N1	C	2	2	2	25	95	1.58	2	no	T1	II A	yes	PP, EP, EX, TOX, A	2	7; 17
1750	CHLORACETIC ACID SOLUTION	6.1	TC1	II	6.1+8+N1	C	2	1	4	25	95	1.58	2	no			no	PP, EP, TOX, A	2	7; 17; 20; +11 °C; 26
1760	CORROSIVE LIQUID, N.O.S.	8	C9	I	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP, EP	0	27; 34 *see flowchart
1760	CORROSIVE LIQUID, N.O.S.	8	C9	II	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP, EP	0	27; 34 *see flowchart

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
1760	CORROSIVE LIQUID, N.O.S.	8	C9	III	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*	*	*	yes			no	PP, EP	0	27; 34 *see flowchart
1760	CORROSIVE LIQUID, N.O.S. (SODIUM MERCAPTOBENZOTHAZOLE, 50 % AQUEOUS SOLUTION)	8	C9	II	8+N1+F	C	2	2		40	95	1.25	2	yes			no	PP, EP	0	
1760	CORROSIVE LIQUID, N.O.S. (FATTY ALCOHOL, C ₁₂ -C ₁₄)	8	C9	III	8+F	N	4	3			97	0.89	3	yes			no	PP, EP	0	34
1760	CORROSIVE LIQUID, N.O.S. (ETHYLENEDIAMINE-TETRAACETIC ACID, TETRASODIUM SALT, 40 % AQUEOUS SOLUTION)	8	C9	III	8+N2	N	4	3			97	1.28	3	yes			no	PP, EP	0	34
1764	DICHLOROACETIC ACID	8	C3	II	8+N1	C	2	2		35	95	1.56	2	yes	T1	II A	yes	PP, EP, EX, A	0	17
1778	FLUOROSILICIC ACID	8	C1	II	8+N3	N	2	3		10	97		3	yes			no	PP, EP	0	34
1779	FORMIC ACID with more than 85% acid by mass	8	CF1	II	8+3+N3	N	2	3		10	97	1.22	3	yes	T1	II A	yes	PP, EP, EX, A	1	6; +12 °C; 17; 34
1780	FUMARYL CHLORIDE	8	C3	II	8+N3	N	2	3		10	97	1.41	3	yes			no	PP, EP	0	8; 34
1783	HEXAMETHYLENEDIAMINE SOLUTION	8	C7	II	8+N3	N	3	2	2		97		3	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EP, EX, A	0	7; 17; 34
1783	HEXAMETHYLENEDIAMINE SOLUTION	8	C7	III	8+N3	N	3	2	2		97		3	yes	T3	II B ⁽⁴⁾	yes	PP, EP, EX, A	0	7; 17; 34
1789	HYDROCHLORIC ACID	8	C1	II	8	N	2	3		10	97		3	yes			no	PP, EP	0	34
1789	HYDROCHLORIC ACID	8	C1	III	8	N	4	3			97		3	yes			no	PP, EP	0	34
1805	PHOSPHORIC ACID, SOLUTION, WITH MORE THAN 80% (VOLUME) ACID	8	C1	III	8	N	4	3	2		95	> 1,6	3	yes			no	PP, EP	0	7; 17; 22; 34

UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1805	PHOSPHORIC ACID, SOLUTION, WITH 80% (VOLUME) ACID, OR LESS	8	C1	III	8	N 4	4	3			97	1,00 - 1,6	3	yes			no	PP, EP	0	22; 34
1814	POTASSIUM HYDROXIDE SOLUTION	8	C5	II	8+N3	N 4	2	2			97		3	yes			no	PP, EP	0	30; 34
1814	POTASSIUM HYDROXIDE SOLUTION	8	C5	III	8+N3	N 4	2	2			97		3	yes			no	PP, EP	0	30; 34
1823	SODIUM HYDROXIDE, SOLID, MOLTEN	8	C6	II	8+N3	N 4	1	4	4		95	2.13	3	yes			no	PP, EP	0	7; 17; 34
1824	SODIUM HYDROXIDE SOLUTION	8	C5	II	8+N3	N 4	2	2			97		3	yes			no	PP, EP	0	30; 34
1824	SODIUM HYDROXIDE SOLUTION	8	C5	III	8+N3	N 4	2	2			97		3	yes			no	PP, EP	0	30; 34
1830	SULPHURIC ACID with more than 51% acid	8	C1	II	8+N3	N 4	3	3			97	1,4 - 1,84	3	yes			no	PP, EP	0	8; 22; 30; 34
1831	SULPHURIC ACID, FUMING	8	CT1	I	8+6.1	C 2	2	2		50	95	1.94	1	no			no	PP, EP, TOX, A	2	8
1832	SULPHURIC ACID, SPENT	8	C1	II	8	N 4	3	3			97		3	yes			no	PP, EP	0	8; 30; 34
1846	CARBON TETRACHLORIDE	6.1	T1	II	6.1+N2+S	C 2	2	2	3	50	95	1.59	2	no			no	PP, EP, TOX, A	2	23
1848	PROPIONIC ACID with not less than 10% and less than 90% acid by mass	8	C3	III	8+N3	N 3	3	3			97	0.99	3	yes	T1	II A ⁷⁾	yes	PP, EP, EX, A	0	34
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10 % BENZENE vp50 > 175 kPa	3	F1	I	3+CMR+F	C 1	1	1			95		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	29
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10 % BENZENE 110 kPa < vp50 ≤ 175 kPa	3	F1	II	3+CMR+F	C 1	1	1			95		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	29

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10 % BENZENE. vp50 ≤ 110 kPa BOILING POINT ≤ 60 °C	3	F1	II	3+CMR+F	C	1	1			95		1	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	29
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10 % BENZENE. vp50 ≤ 110 kPa 60 °C < BOILING POINT ≤ 85 °C	3	F1	II	3+CMR+F	C	2	2	3	50	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	23; 29
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10 % BENZENE. vp50 ≤ 110 kPa 85 °C < BOILING POINT ≤ 115 °C	3	F1	II	3+CMR+F	C	2	2		50	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	29
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10 % BENZENE. vp50 ≤ 110 kPa BOILING POINT > 115 °C	3	F1	II	3+CMR+F	C	2	2		35	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	29
1863	FUEL, AVIATION, TURBINE ENGINE	3	F1	I	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	14; 29 *see flowchart
1863	FUEL, AVIATION, TURBINE ENGINE	3	F1	II	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	14; 29 *see flowchart
1863	FUEL, AVIATION, TURBINE ENGINE	3	F1	III	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	0	14 *see flowchart
1888	CHLOROFORM	6.1	T1	III	6.1+N2+CMR	C	2	2	3	50	95	1.48	2	no			no	PP, EP, TOX, A	0	23
1897	TETRACHLOROETHYLENE	6.1	T1	III	6.1+N2+S	C	2	2		50	95	1.62	2	no			no	PP, EP, TOX, A	0	
1912	METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	2	2F		2.1	G	1	1			91		1	yes	T1	II A ⁽⁸⁾	yes	PP, EX, A	1	31

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1915	CYCLOHEXANONE	3	F1	III	3	N	3	2			97	0.95	3	yes	T2	II A	yes	PP, EX, A	0	
1917	ETHYL ACRYLATE, STABILIZED	3	F1	II	3+unst.+N3	C	2	2		40	95	0.92	1	yes	T2	II B	yes	PP, EX, A	1	3; 5
1918	ISOPROPYLBENZENE (cumene)	3	F1	III	3+N2	N	3	3			97	0.86	3	yes	T2	II A ⁸⁾	yes	PP, EX, A	0	
1919	METHYL ACRYLATE, STABILIZED	3	F1	II	3+unst.+N3	C	2	2	3	50	95	0.95	1	yes	T2	II B	yes	PP, EX, A	1	3; 5; 23
1920	NONANES	3	F1	III	3+N2+F	N	3	3			97	0.70 - 0.75	3	yes	T3	II A	yes	PP, EX, A	0	
1922	PYRROLIDINE	3	FC	II	3+8	C	2	2		50	95	0.86	2	yes	T2	II A	yes	PP, EP, EX, A	1	
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S., (MIXTURE A)	2	2F		2.1	G	1	1			91		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	31
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S., (MIXTURE A0)	2	2F		2.1	G	1	1			91		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	31
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S., (MIXTURE A01)	2	2F		2.1	G	1	1			91		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	31
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S., (MIXTURE A02)	2	2F		2.1	G	1	1			91		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	31
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S., (MIXTURE A1)	2	2F		2.1	G	1	1			91		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	31
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S., (MIXTURE B)	2	2F		2.1	G	1	1			91		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	31
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S., (MIXTURE B1)	2	2F		2.1	G	1	1			91		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	31
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S., (MIXTURE B2)	2	2F		2.1	G	1	1			91		1	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	31

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S., (MIXTURE C)	2	2F		2.1	G	1	1			91		1	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	31
1969	ISOBUTANE	2	2F		2.1	G	1	1			91		1	yes	T2 ⁽¹⁾	II A	yes	PP, EX, A	1	31; 99
1978	PROPANE	2	2F		2.1	G	1	1			91		1	yes	T1	II A	yes	PP, EX, A	1	31
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	FT1	I	3+6.1+ (N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		1	no	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EP, EX, TOX, A	2	27; 29; *see flowchart
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	FT1	II	3+6.1+ (N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EP, EX, TOX, A	2	27; 29; *see flowchart
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	FT1	III	3+6.1+ (N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EP, EX, TOX, A	0	27; 29; *see flowchart
1987	ALCOHOLS, N.O.S. (tert-BUTANOL 90% (MASS)/METHANOL 10% (MASS) MIXTURE)	3	F1	II	3	N	2	2		10	97		3	yes	T1	II A	yes	PP, EX, A	1	
1987	ALCOHOLS, N.O.S.	3	F1	II	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	14; 27; 29 *see flowchart
1987	ALCOHOLS, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	0	14; 27 *see flowchart
1987	ALCOHOLS, N.O.S. (CYCLOHEXANOL)	3	F1	III	3+N3+F	N	3	3	2		95	0.95	3	yes	T3	II A	yes	PP, EX, A	0	7; 17
1987	ALCOHOLS, N.O.S. (CYCLOHEXANOL)	3	F1	III	3+N3+F	N	3	3	4		95	0.95	3	yes			no	PP	0	7; 17; 20: +46 °C
1989	ALDEHYDES, N.O.S.	3	F1	II	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	14; 27; 29 *see flowchart

(1)	(2)	(3a)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
1989	ALDEHYDES, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*	*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	0	14; 27 *see flowchart
1991	CHLOROPRENE, STABILIZED	3	FT1	I	3+6.1+unst.+C MR	C	2	2	3	50	95	1	no	T2	II B ⁽⁴⁾	yes	PP, EP, EX, TOX, A	2	3; 5; 23
1992	FLAMMABLE LIQUID, TOXIC, N.O.S	3	FT1	I	3+6.1+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95	1	no	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EP, EX, TOX, A	2	27; 29 *see flowchart
1992	FLAMMABLE LIQUID, TOXIC, N.O.S	3	FT1	II	3+6.1+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95	2	no	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EP, EX, TOX, A	2	27; 29 *see flowchart
1992	FLAMMABLE LIQUID, TOXIC, N.O.S	3	FT1	III	3+6.1+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95	2	no	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EP, EX, TOX, A	0	27; 29 *see flowchart
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE vp50 > 175 kPa	3	F1	I	3+CMR	C	1	1			95	1	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	27; 29
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa BOILING POINT ≤ 60 °C	3	F1	I	3+CMR	C	1	1			95	1	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	27; 29
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa BOILING POINT ≤ 85 °C	3	F1	II	3+CMR	C	1	1			95	1	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	27; 29
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa BOILING POINT ≤ 85 °C	3	F1	II	3+CMR	C	2	2	3	50	95	2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	23; 27; 29

UN No. or substance identification No.	(1)	Name and description	(2)	Class	(3a)	Classification code	(3b)	Packing group	(4)	Dangers	(5)	Type of tank vessel	(6)	Cargo tank design	(7)	Cargo tank type	(8)	Cargo tank equipment	(9)	Opening pressure of the high-velocity vent valve in kPa	(10)	Maximum degree of filling in %	(11)	Relative density at 20 °C	(12)	Type of sampling device	(13)	Pump room below deck permitted	(14)	Temperature class	(15)	Explosion group	(16)	Anti-explosion protection required	(17)	Equipment required	(18)	Number of cones/blue lights	(19)	Additional requirements/Remarks	(20)
1993		FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE. vp50 ≤ 110 kPa 85 °C < BOILING POINT ≤ 115 °C	3	F1	3	F1	II	II	3+CMR	C	2	2	2	2	2	2	2	2	2	50	95			2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	27; 29										
1993		FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE. vp50 ≤ 110 kPa BOILING POINT > 115 °C	3	F1	3	F1	II	II	3+CMR	C	2	2	2	2	2	2	2	2	2	35	95			2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	27; 29										
1993		FLAMMABLE LIQUID, N.O.S.	3	F1	3	F1	I	I	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	yes	PP, EX, A	1	14; 27; 29 *see flowchart										
1993		FLAMMABLE LIQUID, N.O.S.	3	F1	3	F1	II	II	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	yes	PP, EX, A	1	14; 27; 29 *see flowchart											
1993		FLAMMABLE LIQUID, N.O.S.	3	F1	3	F1	III	III	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	yes	PP, EX, A	0	14; 27 *see flowchart											
1993		FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE 60 °C < BOILING POINT ≤ 85 °C	3	F1	3	F1	III	III	3+CMR	C	2	2	2	2	2	2	2	2	2	50	95			2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	0	23; 27; 29										
1993		FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE 85 °C < BOILING POINT ≤ 115 °C	3	F1	3	F1	III	III	3+CMR	C	2	2	2	2	2	2	2	2	2	50	95			2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	0	27; 29										
1993		FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE BOILING POINT > 115 °C	3	F1	3	F1	III	III	3+CMR	C	2	2	2	2	2	2	2	2	2	35	95			2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	0	27; 29										
1993		FLAMMABLE LIQUID, N.O.S. (CYCLOHEXANONE/ CYCLOHEXANOL MIXTURE)	3	F1	3	F1	III	III	3+F	N	3	3	3	3	3	3	3	3	3		97			0.95	3	yes	T3	II A	yes	PP, EX, A	0										

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1999	TARS, LIQUID, including road asphalt and oils, bitumen and cut backs	3	F1	III	3+S	N	4	3	2		97		3	yes	T3	II A ⁷⁾	yes	PP, EX, A	0	
2014	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20 % but not more than 60 % hydrogen peroxide (stabilized as necessary)	5.1	OC1	II	5.1+8+unst.	C	2	2		35	95	1.2	2	yes			no	PP, EP	0	3; 33
2021	CHLOROPHENOLS, LIQUID (2-CHLOROPHENOL)	6.1	T1	III	6.1+N2	C	2	2		25	95	1.23	2	no	T1	II A ⁷⁾	yes	PP, EP, EX, TOX, A	0	6; +10 °C; 17
2022	CRESYLIC ACID	6.1	TC1	II	6.1+8+3+S	C	2	2		25	95	1.03	2	no	T1	II A	yes	PP, EP, EX, TOX, A	2	6; +16 °C; 17
2023	EPICHLORHYDRINE	6.1	TF1	II	6.1+3+N3	C	2	2		35	95	1.18	2	no	T2	II B	yes	PP, EP, EX, TOX, A	2	5
2031	NITRIC ACID, other than red fuming, with more than 70 % acid	8	CO1	I	8+5.1+N3	N	2	3		10	97	1,41-1,48	3	yes			no	PP, EP	0	34
2031	NITRIC ACID, other than red fuming with at least 65 % but not more than 70 % acid	8	CO1	II	8+5.1+N3	N	2	3		10	97	1,39-1,41	3	yes			no	PP, EP	0	34
2031	NITRIC ACID, other than red fuming, with less than 65 % acid	8	CO1	II	8+N3	N	2	3		10	97	1,02-1,39	3	yes			no	PP, EP	0	34
2032	NITRIC ACID, RED FUMING	8	COT	I	8+5.1+6.1+N3	C	2	2		50	95	1,48-1,51	1	no			no	PP, EP, TOX, A	2	
2045	ISOBUTYRALDEHYDE (ISOBUTYL ALDEHYDE)	3	F1	II	3+N3	C	2	2	3	50	95	0.79	2	yes	T4	II A ⁷⁾	yes	PP, EX, A	1	15; 23
2046	CYMENES	3	F1	III	3+N2+F	N	3	3			97	0.88	3	yes	T2	II A	yes	PP, EX, A	0	
2047	DICHLOROPROPENES (2,3-DICHLOROPROP-1-ENE)	3	F1	II	3+N2+CMR	C	2	2		45	95	1.2	2	yes	T1	II A	yes	PP, EX, A	1	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
2047	DICHLOROPROPENES (MIXTURES of 2,3-DICHLOROPROP-1-ENE and 1,3-DICHLOROPROPENE)	3	F1	II	3+N2+CMR	C	2	2		45	95	1.23	2	yes	T2 ¹⁾	II A	yes	PP, EX, A	1	
2047	DICHLOROPROPENES (MIXTURES of 2,3-DICHLOROPROP-1-ENE and 1,3-DICHLOROPROPENE)	3	F1	III	3+N2+CMR	C	2	2		45	95	1.23	2	yes	T2 ¹⁾	II A	yes	PP, EX, A	0	
2047	DICHLOROPROPENES (1,3-DICHLOROPROPENE)	3	F1	III	3+N2+CMR	C	2	2		40	95	1.23	2	yes	T2 ¹⁾	II A ⁷⁾	yes	PP, EX, A	0	
2048	DICYCLOPENTADIENE	3	F1	III	3+N2+F	N	3	3	2		95	0.94	3	yes	T1	II B ⁴⁾	yes	PP, EX, A	0	7; 17
2050	DIISOBUTYLENE, ISOMERIC COMPOUNDS	3	F1	II	3+N2+F	N	2	3		10	97	0.72	3	yes	T3 ²⁾	II A ⁷⁾	yes	PP, EX, A	1	
2051	2-DIMETHYLAMINO ETHANOL	8	CF1	II	8+3+N3	N	3	2			97	0.89	3	yes	T3	II A	yes	PP, EP, EX, A	1	34
2053	METHYL ISOBUTYL CARBINOL	3	F1	III	3	N	3	2			97	0.81	3	yes	T2	II B ⁴⁾	yes	PP, EX, A	0	
2054	MORPHOLINE	8	CF1	I	8+3+N3	N	3	2			97	1	3	yes	T3	II A	yes	PP, EP, EX, A	1	34
2055	STYRENE MONOMER, STABILIZED	3	F1	III	3+unst.+N3	N	3	2			97	0.91	3	yes	T1	II A	yes	PP, EX, A	0	3; 5; 16
2056	TETRAHYDROFURAN	3	F1	II	3	N	2	2		10	97	0.89	3	yes	T3	II B	yes	PP, EX, A	1	
2057	TRIPROPYLÈNE	3	F1	II	3	N	2	2		10	97	0.744	3	yes	T3	II B ⁴⁾	yes	PP, EX, A	1	
2057	TRIPROPYLENE	3	F1	III	3	N	3	2			97	0.73	3	yes	T3	II B ⁴⁾	yes	PP, EX, A	0	
2078	TOLUENE DIISOCYANATE (and isomeric mixtures) (2,4- TOLUENE DIISOCYANATE)	6.1	T1	II	6.1+N2+S	C	2	2	2	25	95	1.22	2	no	T1	II B ⁴⁾	yes	PP, EP, EX, TOX, A	2	2; 7; 8; 17
2078	TOLUENE DIISOCYANATE (and isomeric mixtures) (2,4- TOLUENE DIISOCYANATE)	6.1	T1	II	6.1+N2+S	C	2	1	4	25	95	1.22	2	no			no	PP, EP, TOX, A	2	2; 7; 8; 17; 20; +112 °C; 26
2079	DIETHYLENETRIAMINE	8	C7	II	8+N3	N	4	2			97	0.96	3	yes			no	PP, EP	0	34

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Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks		
2205	6.1	T1	III	6.1	C	2	2		25	95	0.96	2	no	T4 ³⁾	II B ⁴⁾	yes	PP, EP, EX, TOX, A	0	17		
2206	6.1	T1	II	6.1+S	C	2	2	4	25	95	1.25	2	no			no	PP, EP, TOX, A	2	7; 17		
2209	8	C9	III	8+N3	N	4	2			97	1.09	3	yes			no	PP, EP	0	15; 34		
2215	8	C3	III	8+N3	N	3	3	2		95	0.93	3	yes	T2	II B ⁴⁾	yes	PP, EP, EX, A	0	7; 17; 25; 34		
2215	8	C3	III	8+N3	N	3	1	4		95	0.93	3	yes			no	PP, EP	0	7; 17; 20: +88 °C; 25; 34		
2218	8	CF1	II	8+3+unst.+N1	C	2	2	4	30	95	1.05	1	yes	T2	II A ⁷⁾	yes	PP, EP, EX, A	1	3; 4; 5; 17		
2227	3	F1	III	3+unst.	C	2	2		25	95	0.9	1	yes	T3	II A	yes	PP, EX, A	0	3; 5		
2238	3	F1	III	3+N2+S	C	2	2		30	95	1.08	2	yes	T1	II A ⁷⁾	yes	PP, EX, A	0			
2238	3	F1	III	3+S	C	2	2		30	95	1.08	2	yes	T1	II A ⁷⁾	yes	PP, EX, A	0			
2238	3	F1	III	3+S	C	2	2		30	95	1.07	2	yes	T1	II A ⁷⁾	yes	PP, EX, A	0	6; +11 °C; 17		
2241	3	F1	II	3+N2	N	2	3		10	97	0.81	3	yes	T4 ³⁾	II A	yes	PP, EX, A	1			
2247	3	F1	III	3+F	C	2	2		30	95	0.73	2	yes	T4	II A	yes	PP, EX, A	0			
2248	8	CF1	II	8+3+N3	N	3	2				0.76	3	yes	T3	II A ⁷⁾	yes	PP, EP, EX, A	1	34		
2259	8	C7	II	8+N2	N	3	3			97	0.98	3	yes	T2	II B ⁴⁾	yes	PP, EP, EX, A	0	34		
2263	3	F1	II	3	C	2	2		35	95	0.78	2	yes	T4 ³⁾	II A ⁷⁾	yes	PP, EX, A	1			

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
2263	DIMETHYLCYCLOHEXANES (trans-1,4- DIMETHYL- CYCLOHEXANE)	3	F1	II	3	C	2	2		35	95	0.76	2	yes	T4 ³⁾	II A ⁷⁾	yes	PP, EX, A	1	
2264	N,N-DIMETHYL- CYCLOHEXYLAMINE	8	CF1	II	8+3+N2	N	3	3			97	0.85	3	yes	T3	II B ⁴⁾	yes	PP, EP, EX, A	1	34
2265	N,N-DIMETHYLFORMAMIDE	3	F1	III	3+CMR	N	2	3	3	10	97	0.95	3	yes	T2	II A	yes	PP, EX, A	0	
2266	DIMETHYL-N-PROPYLAMINE	3	FC	II	3+8	C	2	2	3	50	95	0.72	2	yes	T4	II A	yes	PP, EP, EX, A	1	23
2276	2-ETHYLHEXYLAMINE	3	FC	III	3+8+N3	N	3	2			97	0.79	3	yes	T3	II A ⁷⁾	yes	PP, EP, EX, A	0	34
2278	n-HEPTENE	3	F1	II	3+N3	N	2	2		10	97	0.7	3	yes	T3	II B ⁴⁾	yes	PP, EX, A	1	
2280	HEXAMETHYLENEDIAMINE, SOLID, MOLTEN	8	C8	III	8+N3	N	3	3	2		95	0.83	3	yes	T3	II B ⁴⁾	yes	PP, EP, EX, A	0	7; 17; 34
2280	HEXAMETHYLENEDIAMINE, SOLID, MOLTEN	8	C8	III	8+N3	N	3	3	4		95	0.83	3	yes			no	PP, EP	0	7; 17; 20: +66 °C; 34
2282	HEXANOLS	3	F1	III	3+N3	N	3	2			97	0.83	3	yes	T3	II A	yes	PP, EX, A	0	
2286	PENTAMETHYLHEPTANE	3	F1	III	3+F	N	3	3			97	0.75	3	yes	T2	II A ⁷⁾	yes	PP, EX, A	0	
2288	ISOHEXENES	3	F1	II	3+unst.	C	2	2	3	50	95	0.735	2	yes	T2	II B ⁴⁾	yes	PP, EX, A	1	3; 23
2289	ISOPHORONEDIAMINE	8	C7	III	8+N2	N	3	3			97	0.92	3	yes	T2	II A	yes	PP, EP, EX, A	0	17; 34
2302	5-METHYLHEXAN-2-ONE	3	F1	III	3	N	3	2			97	0.81	3	yes	T1	II A	yes	PP, EX, A	0	
2303	ISOPROPENYLBENZENE	3	F1	III	3+N2+F	N	3	3			97	0.91	3	yes	T2	II B	yes	PP, EX, A	0	
2309	OCTADIENE (1,7-OCTADIENE)	3	F1	II	3+N2	N	2	3		10	97	0.75	3	yes	T3	II B ⁴⁾	yes	PP, EX, A	1	
2311	PHENETIDINES	6.1	T1	III	6.1	C	2	2		25	95	1.07	2	no			no	PP, EP, TOX, A	0	6; +7 °C; 17
2312	PHENOL, MOLTEN	6.1	T1	II	6.1+N3+S	C	2	2	4	25	95	1.07	2	no	T1	II A ⁸⁾	yes	PP, EP, EX, TOX, A	2	7; 17
2312	PHENOL, MOLTEN	6.1	T1	II	6.1+N3+S	C	2	2	4	25	95	1.07	2	no			no	PP, EP, TOX, A	2	7; 17; 20: +67 °C

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
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2320	TETRAETHYLENEPENTAMINE	8	C7	III	8+N2	N	4	3			97	1	3	yes			no	PP, EP	0	34
2321	TRICHLOROBENZENES, LIQUID (1,2,4-TRICHLOROBENZENE)	6.1	T1	III	6.1+NI+S	C	2	2	2	25	95	1.45	2	no	T1	II A	yes	PP, EP, EX, TOX, A	0	7; 17
2321	TRICHLOROBENZENES, LIQUID (1,2,4-TRICHLOROBENZENE)	6.1	T1	III	6.1+NI+S	C	2	1	4	25	95	1.45	2	no			no	PP, EP, TOX, A	0	7; 17; 20; +95 °C; 26
2323	TRIETHYL PHOSPHITE	3	F1	III	3	N	3	2			97	0.8	3	yes	T3	II B ^d	yes	PP, EX, A	0	
2324	TRISOBUTYLENE	3	F1	III	3+NI+F	C	2	2		35	95	0.76	2	yes	T2	II B ^d	yes	PP, EX, A	0	
2325	1,3,5-TRIMETHYLBENZENE	3	F1	III	3+NI	C	2	2		35	95	0.87	2	yes	T1	II A	yes	PP, EX, A	0	
2333	ALLYL ACETATE	3	FT1	II	3+6.1	C	2	2		40	95	0.93	2	no	T2	II A ⁷	yes	PP, EP, EX, TOX, A	2	
2348	BUTYL ACRYLATES, STABILIZED (n-BUTYL ACRYLATE, STABILIZED)	3	F1	III	3+unst.+N3	C	2	2		30	95	0.9	1	yes	T3	II B	yes	PP, EX, A	0	3; 5
2350	BUTYL METHYL ETHER	3	F1	II	3	N	2	2		10	97	0.74	3	yes	T4 ³⁾	II B ^d	yes	PP, EX, A	1	
2356	2-CHLOROPROPANE	3	F1	I	3	C	2	2	3	50	95	0.86	2	yes	T1	II A	yes	PP, EX, A	1	23
2357	CYCLOHEXYLAMINE	8	CF1	II	8+3+N3	N	3	2			97	0.86	3	yes	T3	II A ⁸⁾	yes	PP, EP, EX, A	1	34
2362	1,1-DICHLOROETHANE	3	F1	II	3+N2	C	2	2	3	50	95	1.17	2	yes	T2	II A	yes	PP, EX, A	1	23
2370	1-HEXENE	3	F1	II	3+N3	N	2	2		10	97	0.67	3	yes	T3	II B ^d	yes	PP, EX, A	1	
2381	DIMETHYL DISULPHIDE	3	F1	II	3	C	2	2		40	95	1.063	2	yes	T2	II B	yes	PP, EX, A	1	
2382	DIMETHYLHYDRAZINE, SYMMETRICAL	6.1	TF1	I	6.1+3+CMR	C	2	2		50	95	0.83	1	yes	T4 ³⁾	II C	yes	PP, EP, EX, TOX, A	2	
2383	DIPROPYLAMINE	3	FC	II	3+8	C	2	2		35	95	0.74	2	no	T3	II A	yes	PP, EP, EX, A	1	
2397	3-METHYLBUTAN-2-ONE	3	F1	II	3	N	2	2		10	97	0.81	3	yes	T1	II A	yes	PP, EX, A	1	
2398	METHYL tert-BUTYL ETHER	3	F1	II	3	N	2	2		10	97	0.74	3	yes	T1	II A	yes	PP, EX, A	1	
2404	PROPIONITRILE	3	FT1	II	3+6.1	C	2	2		45	95	0.78	2	no	T1 ⁹⁾	II A	yes	PP, EP, EX, TOX, A	2	

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
2527	ISOBUTYL ACRYLATE, STABILIZED	3	F1	III	3+unst.	C	2	2		30	95	0.89	1	yes	T2	II B ⁰	yes	PP, EX, A	0	3; 5
2528	ISOBUTYL ISOBUTYRATE	3	F1	III	3+N3	N	3	2			97	0.86	3	yes	T2	II A	yes	PP, EX, A	0	
2531	METHACRYLIC ACID, STABILIZED	8	C3	II	8+unst.+N3	C	2	2	4	25	95	1.02	1	yes	T2	II B ⁰	yes	PP, EP, EX, A	0	3; 4; 5; 17
2564	TRICHLOROACETIC ACID SOLUTION	8	C3	II	8+N1	C	2	2	2	25	95	1,62 ⁽¹⁾	2	yes	T1	II A ⁷	yes	PP, EP, EX, A	0	7; 17; 22
2564	TRICHLOROACETIC ACID SOLUTION	8	C3	III	8+N1	C	2	2		25	95	1,62 ⁽¹⁾	2	yes	T1	II A ⁷	yes	PP, EP, EX, A	0	22
2574	TRICRESYL PHOSPHATE with more than 3% ortho isomer	6.1	T1	II	6.1+S	C	2	2		25	95	1.18	2	no			no	PP, EP, TOX, A	2	
2579	PIPERAZINE, MOLTEN	8	C8	III	8+N2	N	3	3	2		95	0.9	3	yes			no	PP, EP	0	7; 17; 34
2582	FERRIC CHLORIDE SOLUTION	8	C1	III	8	N	4	3			97	1.45	3	yes			no	PP, EP	0	22; 30; 34
2586	ALKYL-SULPHONIC ACIDS, LIQUID or ARYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	8	C3	III	8	N	4	3			97		3	yes			no	PP, EP	0	34
2608	NITROPROPANES	3	F1	III	3	N	3	2			97	1	3	yes	T2	II B ⁷	yes	PP, EX, A	0	
2615	ETHYL PROPYL ETHER	3	F1	II	3	N	2	2		10	97	0.73	3	yes	T4 ⁽³⁾	II A ⁷	yes	PP, EX, A	1	
2618	VINYLTOLUENES, STABILIZED	3	F1	III	3+unst.+F	C	2	2		25	95	0.92	1	yes	T1	II B ⁰	yes	PP, EX, A	0	3; 5
2651	4,4'-DIAMINO-DIPHENYLMETHANE	6.1	T2	III	6.1+N2+CMR+S	C	2	2	2	25	95	1	2	no			no	PP, EP, TOX, A	0	7; 17
2672	AMMONIA SOLUTION (relative density between 0.880 and 0.957 at 15 °C in water, with more than 10% but not more than 35 % ammonia)	8	C5	III	8+N1	C	2	2		50	95	0,88 ⁽¹⁰⁾ - 0,96 ⁽¹⁰⁾	2	yes			no	PP, EP	0	
2683	AMMONIUM SULPHIDE SOLUTION	8	CFT	II	8+3+6.1	C	2	2		50	95		2	no	T4 ⁽³⁾	II B ⁰	yes	PP, EP, EX, TOX, A	2	15; 16

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
2693	BISULPHITES, AQUEOUS SOLUTION, N.O.S.	8	C1	III	8	N	4	3			97		3	yes			no	PP, EP	0	27; 34
2709	BUTYLBENZENES	3	F1	III	3+N1+F	C	2	2		35	95	0.87	2	yes	T2	II A	yes	PP, EX, A	0	
2733	AMINES, FLAMMABLE, CORROSIVE, N.O.S. or POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S. (2-AMINOBUTANE)	3	FC	II	3+8	C	2	2	3	50	95	0.72	2	yes	T4 ³⁾	II A	yes	PP, EP, EX, A	1	23
2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8	C7	I	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP, EP	0	27; 34 *see flowchart
2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8	C7	II	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP, EP	0	27; 34 *see flowchart
2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8	C7	III	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP, EP	0	27; 34 *see flowchart
2754	N-ETHYLTOLUIDINES (N-ETHYL-o-TOLUIDINE)	6.1	T1	II	6.1+F	C	2	2		25	95	0.94	2	no			no	PP, EP, TOX, A	2	
2754	N-ETHYLTOLUIDINES (N-ETHYL-m-TOLUIDINE)	6.1	T1	II	6.1+F	C	2	2		25	95	0.94	2	no			no	PP, EP, TOX, A	2	
2754	N-ETHYLTOLUIDINES (N-ETHYL-o-TOLUIDINE and N-ETHYL-m-TOLUIDINE MIXTURES)	6.1	T1	II	6.1+F	C	2	2		25	95	0.94	2	no			no	PP, EP, TOX, A	2	
2754	N-ETHYLTOLUIDINES (N-ETHYL-p-TOLUIDINE)	6.1	T1	II	6.1+F	C	2	2	2	25	95	0.94	2	no			no	PP, EP, TOX, A	2	7; 17
2785	4-THIAPENTANAL (3-METHYLMERCAPTO-PROPIONALDÉHYDE)	6.1	T1	III	6.1	C	2	2		25	95	1.04	2	no			no	PP, EP, TOX, A	0	

UN No. or substance identification No.	(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
2789	8	ACETIC ACID, GLACIAL or ACETIC ACID SOLUTION, more than 80 % acid, by mass	CF1	II	8+3	N	2	3	2	2	10	95	1,05 with 100% acid	3	yes	T1	II A	yes	PP, EP, EX, A	1	7; 17; 34
2790	8	ACETIC ACID SOLUTION, not less than 50 % but not more than 80 % acid, by mass	C3	II	8	N	2	3	3	3	10	95		3	yes			no	PP, EP	0	34
2790	8	ACETIC ACID SOLUTION, more than 10 % and less than 50 % acid, by mass	C3	III	8	N	2	3	3	3	10	95		3	yes			no	PP, EP	0	34
2796	8	BATTERY FLUID, ACID	C1	II	8+N3	N	4	3	3	3		97	1,00 - 1,84	3	yes			no	PP, EP	0	8; 22; 30; 34
2796	8	SULPHURIC ACID with not more than 51 % acid	C1	II	8+N3	N	4	3	3	3		97	1,00 - 1,41	3	yes			no	PP, EP	0	8; 22; 30; 34
2797	8	BATTERY FLUID, ALKALI	C5	II	8+N3	N	4	3	3	3		97	1,00 - 2,13	3	yes			no	PP, EP	0	22; 30; 34
2810	6.1	TOXIC LIQUID, ORGANIC, N.O.S.	T1	I	6.1+(N1, N2, N3, CMR, F or S)	C	2	2	2	*	*	95		1	no			no	PP, EP, TOX, A	2	27; 29 *see flowchart
2810	6.1	TOXIC LIQUID, ORGANIC, N.O.S.	T1	II	6.1+(N1, N2, N3, CMR, F or S)	C	2	2	2	*	*	95		2	no			no	PP, EP, TOX, A	2	27; 29 *see flowchart
2810	6.1	TOXIC LIQUID, ORGANIC, N.O.S.	T1	III	6.1+(N1, N2, N3, CMR, F or S)	C	2	2	2	*	*	95		2	no			no	PP, EP, TOX, A	0	27; 29 *see flowchart
2811	6.1	TOXIC SOLID, ORGANIC, N.O.S. (1,2,3-TRICHLOROBENZENE, MOLTEN)	T2	III	6.1+S	C	2	2	2	2	25	95		2	no	T4 ³⁾	II B ⁴⁾	yes	PP, EP, EX, TOX, A	0	7; 17; 22
2811	6.1	TOXIC SOLID, ORGANIC, N.O.S. (1,2,3-TRICHLOROBENZENE, MOLTEN)	T2	III	6.1+S	C	2	1	4	25	95	95		2	no			no	PP, EP, TOX, A	0	7; 17; 20; +92 °C; 22; 26

UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
2811	TOXIC SOLID, ORGANIC, N.O.S. (1,3,5-TRICHLOROBENZENE, MOLTEN)	6.1	T2	III	6.1+S	C	2	2	2	25	95		2	no	T4 ³⁾	II B ⁴⁾	yes	PP, EP, EX, TOX, A	0	7; 17; 22
2811	TOXIC SOLID, ORGANIC, N.O.S. (1,3,5-TRICHLOROBENZENE, MOLTEN)	6.1	T2	III	6.1+S	C	2	1	4	25	95		2	no			no	PP, EP, TOX, A	0	7; 17; 20; +92 °C; 22; 26
2815	N-AMINOETHYL PIPERAZINE	8	C7	III	8+N2	N	4	3			97	0.98	3	yes			no	PP, EP	0	34
2820	BUTYRIC ACID	8	C3	III	8+N3	N	2	3		10	97	0.96	3	yes			no	PP, EP	0	34
2829	CAPROIC ACID	8	C3	III	8+N3	N	4	3			97	0.92	3	yes			no	PP, EP	0	34
2831	1,1,1-TRICHLOROETHANE	6.1	T1	III	6.1+N2	C	2	2	3	50	95	1.34	2	no			no	PP, EP, TOX, A	0	23
2850	PROPYLENE TETRAMER	3	F1	III	3+NI+F	C	2	2		35	95	0.76	2	yes			no	PP	0	
2874	FURFURYL ALCOHOL	6.1	T1	III	6.1+N3	C	2	2		25	95	1.13	2	no			no	PP, EP, TOX, A	0	
2904	PHENOLATES, LIQUID	8	C9	III	8	N	4	2			97	1,13-1,18	3	yes			no	PP, EP	0	34
2920	CORROSIVE LIQUID, FLAMMABLE, N.O.S. (AQUEOUS SOLUTION OF HEXADECYLTRIMETHYL-AMMONIUM CHLORIDE, AMMONIUM CHLORIDE, AQUEOUS SOLUTION)	8	CF1	II	8+3+F	N	3	3			95	0.95	3	yes	T3	II A	yes	PP, EP, EX, A	1	34;
2920	CORROSIVE LIQUID, FLAMMABLE, N.O.S. (AQUEOUS SOLUTION OF HEXADECYLTRIMETHYL-AMMONIUM CHLORIDE (50 %) AND ETHANOL (35 %))	8	CF1	II	8+3+F	N	2	3		10	95	0.9	3	yes	T2	II B	yes	PP, EP, EX, A	1	6; +7 °C; 17; 34;
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	CT1	I	8+6.1+ (NI, N2, N3, CMR, F or S)	C	2	2	*	*	95		1	no			no	PP, EP, TOX, A	2	27; 29 *sec flowchart

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	CT1	II	8+6.1+ (N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no			no	PP, EP, TOX, A	2	27; 29 *see flowchart
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	CT1	III	8+6.1+ (N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no			no	PP, EP, TOX, A	0	27; 29 *see flowchart
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S.	3	FC	I	3+8+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		1	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EP, EX, A	1	27; 29 *see flowchart
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S.	3	FC	II	3+8+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EP, EX, A	1	27; 29 *see flowchart
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S.	3	FC	III	3+8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EP, EX, A	0	27; 34 *see flowchart
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S. (AQUEOUS SOLUTION OF DIALKYL-(C ₈ -C ₁₈)-DIMETHYLAMMONIUM CHLORIDE AND 2-PROPANOL)	3	FC	II	3+8+F	C	2	2		50	95	0.88	2	yes	T2	II A	yes	PP, EP, EX, A	1	
2927	TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S.	6.1	TC1	I	6.1+8+ (N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		1	no			no	PP, EP, TOX, A	2	27; 29 *see flowchart
2927	TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S.	6.1	TC1	II	6.1+8+ (N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no			no	PP, EP, TOX, A	2	27; 29 *see flowchart
2929	TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.	6.1	TF1	I	6.1+3+ (N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		1	no	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EP, EX, TOX, A	2	27; 29 *see flowchart
2929	TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.	6.1	TF1	II	6.1+3+ (N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EP, EX, TOX, A	2	27; 29 *see flowchart

UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
2935	ETHYL-2-CHLORO-PROPIONATE	3	F1	III	3	C	2	2		30	95	1.08	2	yes	T4 ³⁾	II A	yes	PP, EX, A	0	
2947	ISOPROPYL CHLOROACETATE	3	F1	III	3	C	2	2		30	95	1.09	2	yes	T4 ³⁾	II A	yes	PP, EX, A	0	
2966	THIOGLYCOL	6.1	T1	II	6.1	C	2	2		25	95	1.12	2	no			no	PP, EP, TOX, A	2	
2983	ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE, with not more than 30% ethylene oxide	3	FT1	I	3+6.1+unst.	C	1	1	3		95	0.85	1	no	T2	II B	yes	PP, EP, EX, TOX, A	2	2; 3; 12; 31
2984	HYDROGEN PEROXIDE AQUEOUS SOLUTION with not less than 8%, but less than 20% hydrogen peroxide (stabilized as necessary)	5.1	O1	III	5.1+unst.	C	2	2		35	95	1.06	2	yes			no	PP	0	3; 33
3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., MOLTEN, (ALKYLAMINE (C ₁₂ to C ₁₈))	9	M7	III	9+F	N	4	3	2		95	0.79	3	yes			no	PP	0	7; 17
3079	METHACRYLONITRILE, STABILIZED	3	FT1	I	3+6.1+unst.+ N3	C	2	2		45	95	0.8	1	no	T1	II B ⁴⁾	yes	PP, EP, EX, TOX, A	2	3; 5
3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	9	M6	III	9+(N1, N2, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP	0	22; 27 * see flowchart
3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BILGE WATER)	9	M6	III	9+N2+F	N	4	3			97		3	yes			no	PP	0	
3092	1-METHOXY-2-PROPANOL	3	F1	III	3	N	3	2			97	0.92	3	yes	T3	II B	yes	PP, EX, A	0	
3145	ALKYLPHENOLS, LIQUID, N.O.S. (including C ₂ -C ₁₂ homologues)	8	C3	II	8+N3	N	4	3			97	0.95	3	yes			no	PP, EP	0	34
3145	ALKYLPHENOLS, LIQUID, N.O.S. (including C ₂ -C ₁₂ homologues)	8	C3	III	8+N3	N	4	3			97	0.95	3	yes			no	PP, EP	0	34

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
3256	ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point (CREOSOTE OIL)	3	F2	III	3+NI+F	C	2	2	2	10	95		2	yes	T 2	II B	yes	PP, EX, A	0	7
3256	ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point (Low QI Pitch)	3	F2	III	3(??)+F	N	3	1	4		95	1,1-1,3	3	yes	T2	II B	yes	PP, EX, A	0	7
3257	ELEVATED TEMPERATURE LIQUID, N.O.S. at or above 100 °C and below its flash-point (including molten metals, molten salts, etc.)	9	M9	III	9+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	95		*	yes			no	PP	0	7; 20:-115 °C; 22; 24; 25; 27 *see flowchart
3257	ELEVATED TEMPERATURE LIQUID, N.O.S. at or above 100 °C and below its flash-point (including molten metals, molten salts, etc.)	9	M9	III	9+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	95		*	yes			no	PP	0	7; 20:-225 °C; 22; 24; 27 *see flowchart
3259	AMINES, SOLID, CORROSIVE, N.O.S. (MONOALKYL-(C ₁₂ to C ₁₈)-AMINE ACETATE, MOLTEN)	8	C8	III	8	N	4	3	2		95	0.87	3	yes			no	PP, EP	0	7; 17; 34
3264	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8	C1	I	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP, EP	0	27; 34 *see flowchart
3264	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8	C1	II	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP, EP	0	27; 34 *see flowchart
3264	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8	C1	III	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP, EP	0	27; 34 *see flowchart

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
3267	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	8	C7	I	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP, EP	0	27; 34 *see flowchart
3267	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	8	C7	II	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP, EP	0	27; 34 *see flowchart
3267	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	8	C7	III	8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes			no	PP, EP	0	27; 34 *see flowchart
3271	ETHERS, N.O.S. vp50 ≤ 110 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	*	2	2	3	50	95	0.77	2	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	1	14, 27; 29 *see flowchart
3271	ETHERS, N.O.S. (tert- AMYL- METHYL ETHER)	3	F1	II	3+N1	C	2	2	3				2	yes	T2	II B ⁴⁾	yes	PP, EX, A	1	
3271	ETHERS, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14, 27 *see flowchart
3272	ESTERS, N.O.S. vp50 ≤ 110 kPa	3	F1	II	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T2	II B ⁴⁾	yes	PP, EX, A	1	14, 27; 29 *see flowchart
3272	ESTERS, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	14, 27 *see flowchart
3276	NITRILES, TOXIC, LIQUID, N.O.S. (2-METHYLGLUTARONITRILE)	6.1	T1	II	6.1	C	2	2		10	95	0.95	2	no			no	PP, EP, TOX, A	2	
3286	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3	FTC	I	3+6.1+8+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		1	no	T4 ³⁾	II B ⁴⁾	yes	PP, EP, EX, TOX, A	2	27; 29 *see flowchart

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(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
3286	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3	FTC	II	3+6.1+8+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EP, EX, TOX, A	2	27; 29 *see flowchart
3287	TOXIC LIQUID, INORGANIC, N.O.S.	6.1	T4	I	6.1+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		1	no			no	PP, EP, TOX, A	2	27; 29 *see flowchart
3287	TOXIC LIQUID, INORGANIC, N.O.S.	6.1	T4	II	6.1+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no			no	PP, EP, TOX, A	2	27; 29 *see flowchart
3287	TOXIC LIQUID, INORGANIC, N.O.S.	6.1	T4	III	6.1+(N1, N2, N3, CMR, F or S)	C	2	2	*	30	95	1.68	2	no			no	PP, EP, TOX, A	0	27; 29 *see flowchart
3287	TOXIC LIQUID, INORGANIC, N.O.S. (SODIUM DICHROMATE SOLUTION)	6.1	T4	III	6.1+CMR	C	2	2			95		2	no			no	PP, EP, TOX, A	0	
3289	TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S. BOILING POINT > 115 °C	6.1	TC3	I	6.1+8+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no			no	PP, EP, TOX, A	2	27; 29 *see flowchart
3289	TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S. BOILING POINT > 115 °C	6.1	TC3	II	6.1+8+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no			no	PP, EP, TOX, A	2	27; 29 *see flowchart
3295	HYDROCARBONS, LIQUID, N.O.S.	3	F1	I	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	14, 27; 29 *see flowchart
3295	HYDROCARBONS, LIQUID, N.O.S.	3	F1	II	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	14, 27; 29 *see flowchart
3295	HYDROCARBONS, LIQUID, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	0	14, 27 *see flowchart
3295	HYDROCARBONS, LIQUID, N.O.S. (1-OCTEN)	3	F1	II	3+N2+F	N	2	3		10	97	0.71	3	yes	T3	II B ⁽⁴⁾	yes	PP, EX, A	1	14

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
3295	HYDROCARBONS, LIQUID, N.O.S. (POLYCYCLIC AROMATIC HYDROCARBONS MIXTURE)	3	F1	III	3+CMR+F	N	2	3	3	10	97	1.08	3	yes	T1	II A	yes	PP, EX, A	0	14
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE vp50 > 175 kPa	3	F1	I	3+CMR	C	1	1			95		1	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	27; 29
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE 110 kPa < vp50 ≤ 175 kPa	3	F1	I	3+CMR	C	1	1			95		1	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	27; 29
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa BOILING POINT ≤ 60 °C	3	F1	I	3+CMR	C	1	1			95		1	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	27; 29
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa BOILING POINT ≤ 60 °C	3	F1	I	3+CMR	C	2	2	3	50	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	23; 27; 29
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE 110 kPa < vp50 ≤ 175 kPa	3	F1	II	3+CMR	C	1	1			95		1	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	27; 29
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa BOILING POINT ≤ 60 °C	3	F1	II	3+CMR	C	1	1			95		1	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	27; 29
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE vp50 ≤ 110 kPa BOILING POINT ≤ 60 °C	3	F1	II	3+CMR	C	2	2	3	50	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	23; 27; 29; 38

UN No. or substance identification No.	(1)	(2)	(3a)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
3295		HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE. vp50 ≤ 110 kPa. 60 °C < BOILING POINT ≤ 85 °C	3	II	3+CMR	C	2	2	3	50	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	23; 27; 29
3295		HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE. vp50 ≤ 110 kPa. 85 °C < BOILING POINT ≤ 115 °C	3	II	3+CMR	C	2	2		50	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	27; 29
3295		HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE. vp50 ≤ 110 kPa. BOILING POINT > 115 °C	3	II	3+CMR	C	2	2		35	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	1	27; 29
3295		HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE. vp50 ≤ 110 kPa. 60 °C < BOILING POINT ≤ 85 °C	3	F1	3+CMR	C	2	2	3	50	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	0	23; 27; 29
3295		HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE. vp50 ≤ 110 kPa. 85 °C < BOILING POINT ≤ 115 °C	3	F1	3+CMR	C	2	2		50	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	0	27; 29
3295		HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10 % BENZENE. vp50 ≤ 110 kPa. BOILING POINT > 115 °C	3	F1	3+CMR	C	2	2		35	95		2	yes	T4 ⁽³⁾	II B ⁽⁴⁾	yes	PP, EX, A	0	27; 29
3412		FORMIC ACID with not less than 10% but not more than 85% acid by mass	8	II	8+N3	N	2	3		10	97	1.22	3	yes	T1	II A	yes	PP, EP, EX, A	0	6; +12 °C; 17; 34
3412		FORMIC ACID with not less than 5% but less than 10% acid by mass	8	III	8	N	2	3		10	97	1.22	3	yes	T1	II A	yes	PP, EP, EX, A	0	6; +12 °C; 17; 34
3426		ACRYLAMIDE, SOLUTION	6.1	III	6.1	C	2	2		30	95	1.03	2	no			no	PP, EP, TOX, A	0	3; 5; 16

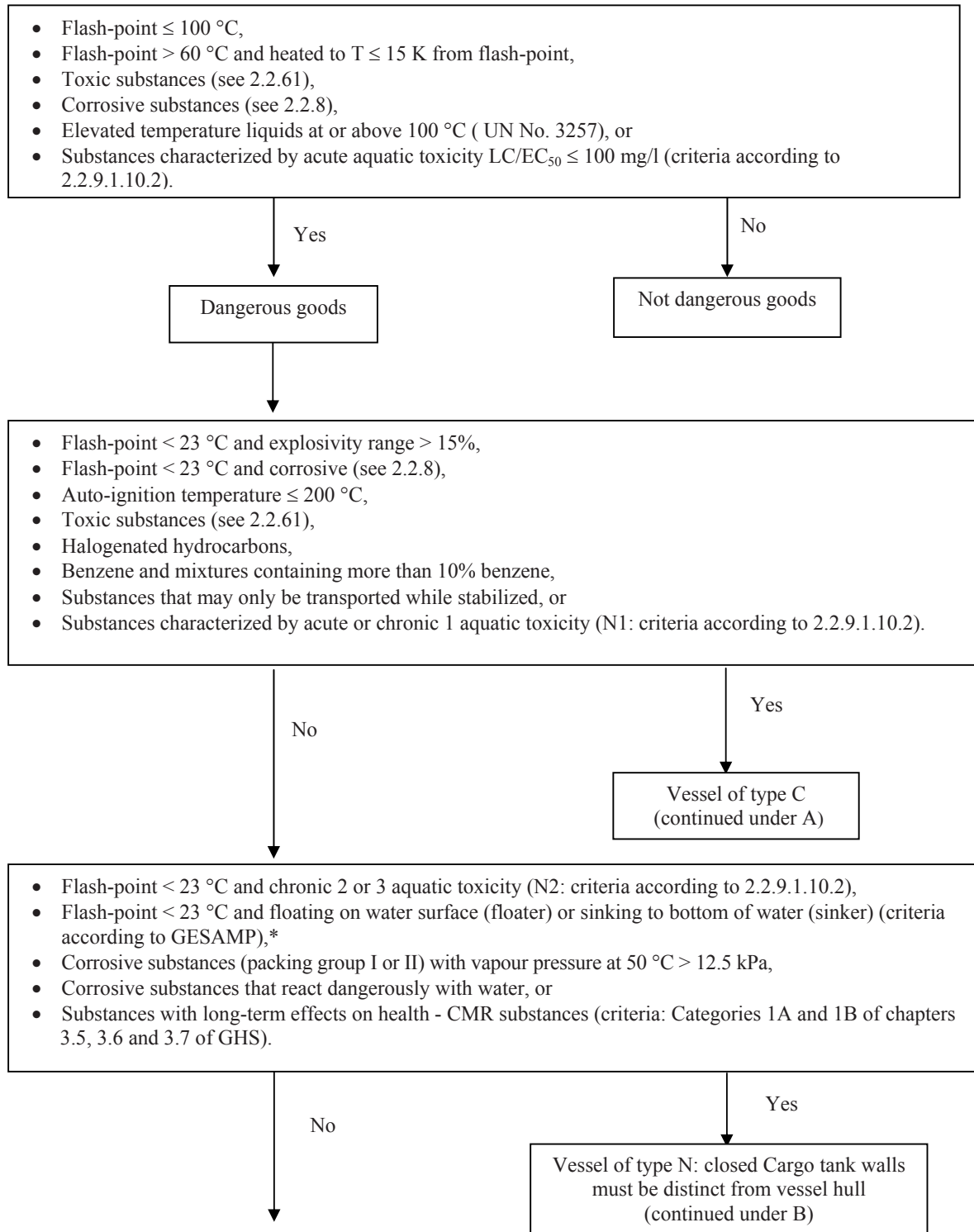
UN No. or substance identification No.	(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the high-velocity vent valve in kPa	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks		
3429	6.1	T1	III	6.1+S	C	2	2		25	95	1.15	2	no	T1	II A ⁷⁾	yes	PP, EP, EX, TOX, A	0	6; +6 °C; 17;		
3446	6.1	T2	II	6.1+S	C	2	2	2	25	95	1.16	2	no	T2	II B ⁴⁾	yes	PP, EP, EX, TOX, A	2	7; 17		
3446	6.1	T2	II	6.1+S	C	2	1	4	25	95	1.16	2	no			no	PP, EP, TOX, A	2	7; 17; 20: +88 °C; 26		
3451	6.1	T2	II	6.1	C	2	2	2	25	95	1.05	2	no	T1	II A ⁸⁾	yes	PP, EP, EX, TOX, A	2	7; 17		
3451	6.1	T2	II	6.1	C	2	2	4	25	95	1.05	2	no			no	PP, EP, TOX, A	2	7; 17; 20: +60 °C		
3455	6.1	TC2	II	6.1+8	C	2	2	2	25	95	1.03 - 1.05	2	no	T1	II A ⁸⁾	yes	PP, EP, EX, TOX, A	2	7; 17		
3455	6.1	TC2	II	6.1+8	C	2	2	4	25	95	1.03 - 1.05	2	no			no	PP, EP, TOX, A	2	7; 17; 20: +66 °C		
3463	8	CF1	II	8+3+N3	N	3	3			97	0.99	3	yes	T1	II A ⁷⁾	yes	PP, EP, EX, A	1	34		
9000	2	3TC		2.1+2.3+8+N1	G	1	1	1; 3		95		1	yes	T1	II A	yes	PP, EP, EX, TOX, A	2	1; 31		
9001	3	F 3		3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 ³⁾	II B ⁴⁾	yes	PP, EX, A	0	27 *see flowchart		
9002	3	F 4		3+(N1, N2, N3, CMR, F or S)	C	1	1	*	*	95		1	yes	T4	II B ⁴⁾	yes	PP, EX, A	0	*see flowchart		

UN No. or substance identification No.	(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
9003		SUBSTANCES WITH A FLASH-POINT ABOVE 60 °C BUT NOT MORE THAN 100 °C or SUBSTANCES WHERE 60° C < flash- point ≤ 100° C, which are not affected to another class	9			9+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*	*	*	yes			no	PP	0	27 *see flowchart
9003		SUBSTANCES WITH A FLASH-POINT ABOVE 60 °C BUT NOT MORE THAN 100 °C or SUBSTANCES WHERE 60° C < flash- point ≤ 100 °C, which are not affected to another class (ETHYLENE GLYCOL MONOBUTYL ETHER)	9			9+N3+F	N	4	3			97	0.9	3	yes			no	PP	0	
9003		SUBSTANCES WITH A FLASH-POINT ABOVE 60 °C BUT NOT MORE THAN 100 °C or SUBSTANCES WHERE 60° C < flash- point ≤ 100 °C, which are not affected to another class (2-ETHYLHEXYLACRYLATE)	9			9+N3+F	N	4	3			97	0.89	3	yes			no	PP	0	3; 5; 16;
9004		DIPHENYLMETHANE- 4,4'-DIISOCYANATE	9			S	N	2	3	4	10	95	1,21 ⁽¹⁾	3	yes			no	PP	0	7; 8; 17; 19
9005		ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., MOLTEN	9			9+(N3, CMR, F or S)	*	*	*	*	*	97		*	yes			no	PP	0	*see flowchart
9006		ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	9			9+(N3, CMR, F or S)	*	*	*	*	*	97		*	yes			no	PP	0	*see flowchart

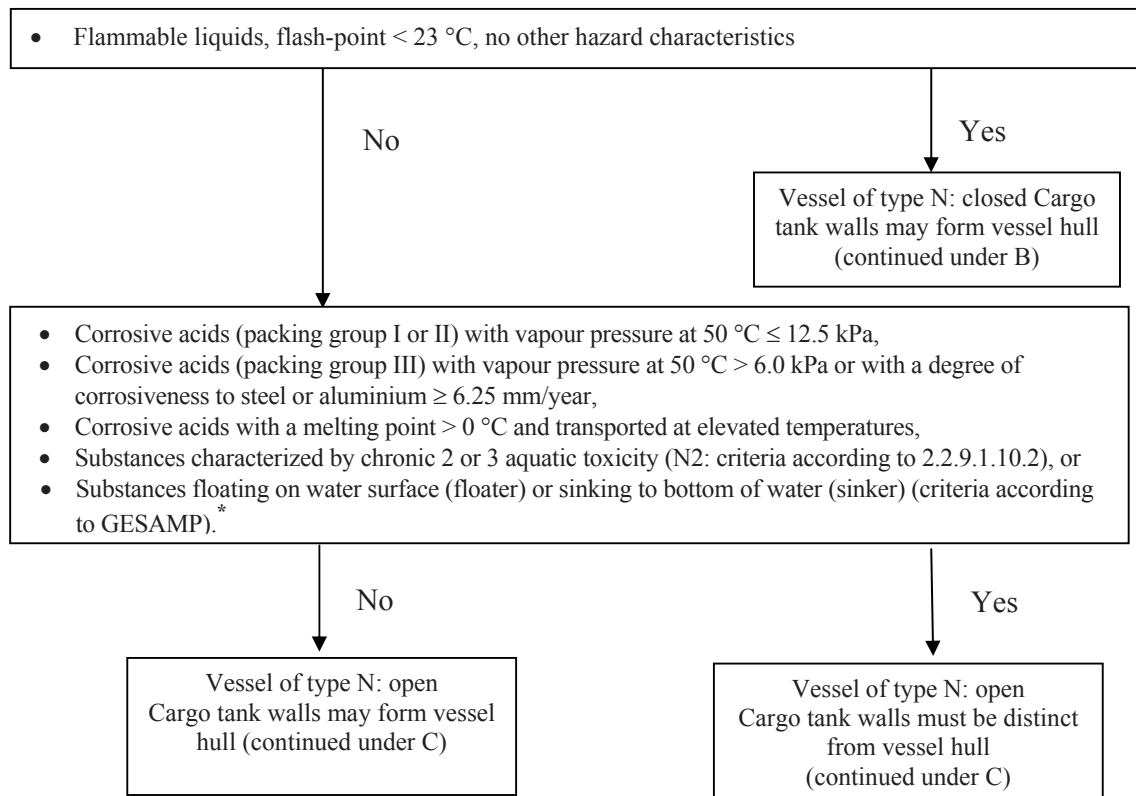
Footnotes related to the list of substances

- 1) The ignition temperature has not been determined in accordance with IEC 79-4; therefore, provisional assignment has been made to temperature class T2 which is considered safe.
- 2) The ignition temperature has not been determined in accordance with IEC 79-4; therefore, provisional assignment has been made to temperature class T3 which is considered safe.
- 3) The ignition temperature has not been determined in accordance with IEC 79-IA; therefore, provisional assignment has been made to temperature class T4 which is considered safe.
- 4) No maximum experimental safe gap (MESG) has been measured in accordance with IEC 79-1A; therefore, provisional assignment has been made to explosion group IIB which is considered safe.
- 5) No maximum experimental safe gap (MESG) has been measured in accordance with IEC 79-1A; therefore, provisional assignment has been made to explosion group IIC which is considered safe.
- 6) The maximum experimental safe gap (MESG) is within the marginal range between explosion group IIA and IIB.
- 7) No maximum experimental safe gap (MESG) has been measured in accordance with IEC-79-1A; therefore, assignment has been made to the explosion group which is considered safe.
- 8) No maximum experimental safe gap (MESG) has been measured in accordance with IEC 79-1A; therefore, assignment has been made to the explosion group in compliance with EN 50014.
- 9) Assignment in accordance with IMO IBC Code.
- 10) Relative density at 15 °C.
- 11) Relative density at 25 °C.
- 12) Relative density at 37 °C.
- 13) Indications related to the pure substance.

Flowchart for classification of liquids of Classes 3, 6.1, 8 and 9 for carriage in tanks in inland navigation



* IMO publication: "The Revised GESAMP Hazard Evaluation Procedure for Chemical Substances Carried by Ships", GESAMP Reports and Studies No. 64, IMO, London, 2002.



Elevated temperature substances

Irrespective of the above classifications, for substances that must be transported at elevated temperatures, the type of cargo tank shall be determined on the basis of the transport temperature, using the following table:

Maximum transport temperature T in °C	Type N	Type C
T ≤ 80	Integral cargo tank	Integral cargo tank
80 < T ≤ 115	Independent cargo tank, remark 25	Independent cargo tank, remark 26
T > 115	Independent cargo tank	Independent cargo tank

* IMO publication: "The Revised GESAMP Hazard Evaluation Procedure for Chemical Substances Carried by Ships", GESAMP Reports and Studies No. 64, IMO, London, 2002.

Scheme A: Criteria for cargo tank equipment in vessels of type C

Cargo tank equipment	Vapour pressure at liquid temperature of 30 °C and gaseous phase temperature of 37.8 °C > 50 kPa	Vapour pressure at liquid temperature of 30 °C and gaseous phase temperature of 37.8 °C > 50 kPa	Vapour pressure unknown, owing to absence of certain data
With refrigeration (No. 1 in column (9))	Refrigerated		
Pressure tank (400 kPa)	Non-refrigerated	Vapour pressure at 50 °C > 50 kPa without water spraying	Boiling point ≤ 60°C
High-velocity vent valve opening pressure: 50 kPa, with water-spraying system (No. 3 in column (9))		Vapour pressure at 50 °C > 50 kPa with water spraying	60 °C < boiling point ≤ 85°C
High-velocity vent valve opening pressure as calculated, but at least 10 kPa		Vapour pressure at 50 °C ≤ 50 kPa	
High-velocity vent valve opening pressure: 50 kPa			85 °C < boiling point ≤ 115°C
High-velocity vent valve opening pressure: 35 kPa			Boiling point > 115°C

Scheme B: Criteria for equipment of vessels of type N with closed cargo tanks

Cargo tank equipment	Class 3, boiling point < 23°C				Corrosive substances	CMR substances
Pressure tank (400 kPa)	175 kPa ≤ P _{d50} < 300 kPa without refrigeration					
High-velocity vent valve opening pressure: 50 kPa	175 kPa ≤ P _{d50} < 300 kPa, with refrigeration (No. 1 in column (9))	110 kPa ≤ P _{d50} < 175 kPa without water spraying				
High-velocity vent valve opening pressure: 10 kPa			110 kPa ≤ P _{d50} < 150 kPa with water spraying (No. 3 in column (9))	P _{d50} < 110 kPa	Packing group I or II with P _{d50} > 12.5 kPa or reacting dangerously with water	High-velocity vent valve opening pressure: 10 kPa; with water spraying when vapour pressure > 10 kPa (calculation of the vapour pressure according to the formula for column 10, except that Va = 0.03)

Scheme C: Criteria for equipment of vessels of type N with open cargo tanks

Cargo tank equipment	Classes 3 and 9	Flammable substances	Corrosive substances
With flame-arrester	60 °C < flash-point ≤ 100 °C or elevated temperature substances of Class 9	Flash-point > 60 °C transported while heated to ≤ 15 K below flash-point or at or above their flash-point	Flammable substances or acids, transported while heated
Without flame-arrester			Non-flammable substances

Column 9: Cargo tank equipment for substances transported in a molten state– **Possibility of heating the cargo (number 2 in column (9))**

A possibility of heating the cargo shall be required on board:

- When the melting point of the substance to be transported is + 15 °C or greater, or
- When the melting point of the substance to be transported is greater than 0 °C but less than + 15 °C and the outside temperature is no more than 4 K above the melting point. In column (20), reference shall be made to remark 6 with the temperature derived as follows: melting point + 4 K

– **Heating system on board (number 4 in column (9))**

A cargo heating system shall be required on board:

- For substances that must not be allowed to solidify owing to the possibility of dangerous reactions on reheating, and
- For substances that must be maintained at a guaranteed temperature not less than 15 K below their flash-point

Column (10): Determination of opening pressure of high-velocity vent valve in kPa

For vessels of type C, the opening pressure of the high-velocity vent valve shall be determined on the basis of the internal pressure of the tanks, rounded up to the nearest 5 kPa

To calculate the internal pressure, the following formula shall be used:

$$P_{\max} = P_{Ob\max} + \frac{k \cdot v_a (P_0 - P_{Da})}{v_a - \alpha \cdot \delta_t + \alpha \cdot \delta_t \cdot v_a} - P_0$$

$$k = \frac{T_{D\max}}{T_a}$$

In this formula:

P_{\max}	:	Maximum internal pressure in kPa
$P_{Ob\max}$:	Maximum absolute vapour pressure at liquid surface temperature in kPa
P_{Da}	:	Absolute vapour pressure at filling temperature in kPa
P_0	:	Atmospheric pressure in kPa
v_a	:	Free relative volume at filling temperature compared with cargo tank volume
α	:	Cubic expansion coefficient in K ⁻¹
δ_t	:	Average liquid temperature increase through reheating in K
$T_{D\max}$:	Maximum gaseous phase temperature in K
T_a	:	Filling temperature in K
k	:	Temperature correction factor
t_{Ob}	:	Maximum liquid surface temperature in °C

In the formula, the following basic data are used:

P_{Obmax}	:	At 50 °C and 30 °C
P_{Da}	:	At 15 °C
P_0	:	101.3 kPa
v_a	:	5% = 0.05
δ_t	:	5 K
T_{Dmax}	:	323 K and 310.8 K
T_a	:	288 K
t_{Ob}	:	50 °C and 30 °C

Column (11): Determination of maximum degree of filling of cargo tanks

If, in accordance with the provisions under A above:

- Type G is required: 91%; however, in the case of deeply refrigerated substances: 95%
- Type C is required: 95%
- Type N is required: 97%; however, in the case of substances in a molten state and of flammable liquids with $175 \text{ kPa} \leq P_{v50} < 300 \text{ kPa}$: 95%

Column (12): Density of substance at 20 °C

These data are provided for information only.

Column (13): Determination of type of sampling connection

- | | | |
|----------------------------|---|--|
| 1 = <i>closed</i> : | – | Substances to be transported in pressure cargo tanks |
| | – | Substances with T in column (3b) and assigned to packing group I |
| | – | Stabilized substances to be transported under inert gas |
| 2 = <i>partly closed</i> : | – | All other substances for which type C is required |
| 3 = <i>open</i> : | – | All other substances |

Column (14): Determination of whether a pump-room is permitted below deck

- | | | |
|-----|---|--|
| No | – | All substances with T in column (3b) with the exception of substances of Class 2 |
| Yes | – | All other substances |

Column (15): Determination of temperature class

Flammable substances shall be assigned to a temperature class on the basis of their auto-ignition point:

Temperature class	Auto-ignition temperature T of flammable liquids and gases in °C
T1	$T > 450$
T2	$300 < T \leq 450$
T3	$200 < T \leq 300$
T4	$135 < T \leq 200$
T5	$100 < T \leq 135$
T6	$85 < T \leq 100$

When anti-explosion protection is required and the auto-ignition temperature is not known, reference shall be made to temperature class T4, considered safe

Column (16): Determination of explosion group

Flammable substances shall be assigned to an explosion group on the basis of their maximum experimental safe gaps. The maximum experimental safe gaps shall be determined in accordance with the standard contained in IEC Publication No. 79-1A

The different explosion groups are as follows:

Explosion group	Maximum experimental safe gap in mm
II A	> 0.9
II B	≥ 0.5 to ≤ 0.9
II C	< 0.5

When anti-explosion protection is required and the relevant data are not provided, reference shall be made to explosion group II B, considered safe

Column (17): Determination of whether anti-explosion protection is required for electrical equipment and systems

- | | | |
|-----|---|---|
| Yes | – | Substances with a flash-point ≤ 60 °C |
| | – | Substances that must be transported while heated to a temperature less than 15 K from their flash-point |
| | – | Flammable gases |
| No | – | All other substances |

Column (18): Determination of whether personal protective equipment, escape devices, portable flammable gas detectors, portable toximeters or ambient-air-dependent breathing apparatus is required

- PP: For all substances of Classes 1 to 9;
- EP: For all substances
 - of Class 2 with letter T or letter C in the classification code indicated in column (3b),
 - of Class 3 with letter T or letter C in the classification code indicated in column (3b),
 - of Class 4.1,

- of Class 6.1, and
- of Class 8,
- CMR substances of Category 1A or 1B according to GHS;
- EX: For all substances for which anti-explosion protection is required;
- TOX: For all substances of Class 6.1,
For all substances of other classes with T in column (3b),
For CMR substances of Category 1A or 1B according to GHS;
- A: For all substances for which EX or TOX is required

Column (19): Determination of the number of cones or blue lights

For all substances of Class 2 with letter F in the classification code indicated in column (3b):	1 cone/light
For all substances of Classes 3 to 9 with letter F in the classification code indicated in column (3b) and assigned to packing group I or II:	1 cone/light
For all substances of Class 2 with letter T in the classification code indicated in column (3b)	2 cones/lights
For all substances of Classes 3 to 9 with letter T in the classification code indicated in column (3b) and assigned to packing group I or II:	2 cones/lights

Column (20): Determination of additional requirements and remarks

- Remark 1:** Reference shall be made in column (20) to remark 1 for transport of UN No. 1005 AMMONIA, ANHYDROUS.
- Remark 2:** Reference shall be made in column (20) to remark 2 for stabilized substances that react with oxygen.
- Remark 3:** Reference shall be made in column (20) to remark 3 for substances that must be stabilized.
- Remark 4:** Reference shall be made in column (20) to remark 4 for substances that must not be allowed to solidify owing to the possibility of dangerous reactions on reheating.
- Remark 5:** Reference shall be made in column (20) to remark 5 for substances liable to polymerization.
- Remark 6:** Reference shall be made in column (20) to remark 6 for substances liable to crystallization and for substances for which a heating system or possibility of heating is required and the vapour pressure of which at 20 °C is greater than 0.1 kPa.
- Remark 7:** Reference shall be made in column (20) to remark 7 for substances with a flash-point of + 15 °C or greater.
- Remark 8:** Reference shall be made in column (20) to remark 8 for substances that react dangerously with water.
- Remark 9:** Reference shall be made in column (20) to remark 9 for transport of UN No. 1131 CARBON DISULPHIDE.
- Remark 10:** *No longer used.*

- Remark 11:** Reference shall be made in column (20) to remark 11 for transport of UN No. 1040 ETHYLENE OXIDE WITH NITROGEN.
- Remark 12:** Reference shall be made in column (20) to remark 12 for transport of UN No. 1280 PROPYLENE OXIDE and UN No. 2983 ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE.
- Remark 13:** Reference shall be made in column (20) to remark 13 for transport of UN No. 1086 VINYL CHLORIDE, STABILIZED.
- Remark 14:** Reference shall be made in column (20) to remark 14 for mixtures or N.O.S. entries which are not clearly defined and for which type N is stipulated under the classification criteria.
- Remark 15:** Reference shall be made in column (20) to remark 15 for substances that react dangerously with alkalis or acids such as sodium hydroxide or sulphuric acid.
- Remark 16:** Reference shall be made in column (20) to remark 16 for substances that may react dangerously to local overheating.
- Remark 17:** Reference shall be made in column (20) to remark 17 when reference is made to remark 6 or 7.
- Remark 18:** *No longer used.*
- Remark 19:** Reference shall be made in column (20) to remark 19 for substances that must under no circumstances come into contact with water.
- Remark 20:** Reference shall be made in column (20) to remark 20 for substances the transport temperature of which must not exceed a maximum temperature in combination with the cargo tank materials. Reference shall be made to this maximum permitted temperature immediately after the number 20.
- Remark 21:** *No longer used.*
- Remark 22:** Reference shall be made in column (20) to remark 22 for substances for which a range of values or no value is indicated in column (11).
- Remark 23:** Reference shall be made in column (20) to remark 23 for substances the internal pressure of which at 30 °C is less than 50 kPa and which are transported with water spraying.
- Remark 24:** Reference shall be made in column (20) to remark 24 for transport of UN No. 3257 ELEVATED TEMPERATURE LIQUID, N.O.S.
- Remark 25:** Reference shall be made in column (20) to remark 25 for substances that must be transported while heated in a type 3 cargo tank.
- Remark 26:** Reference shall be made in column (20) to remark 26 for substances that must be transported while heated in a type 2 cargo tank.
- Remark 27:** Reference shall be made in column (20) to remark 27 for substances for which the reference N.O.S. or a generic reference is made in column (2).
- Remark 28:** Reference shall be made in column (20) to remark 28 for transport of UN No. 2448 SULPHUR, MOLTEN.

- Remark 29:** Reference shall be made in column (20) to remark 29 for substances for which the vapour pressure or boiling point is indicated in column (2).
- Remark 30:** Reference shall be made in column (20) to remark 30 for transport of UN Nos. 1719, 1794, 1814, 1819, 1824, 1829, 1830, 1832, 1833, 1906, 2240, 2308, 2583, 2584, 2677, 2679, 2681, 2796, 2797, 2837 and 3320 under the entries for which open type N is required.
- Remark 31:** Reference shall be made in column (20) to remark 31 for transport of substances of Class 2 and UN Nos. 1280 PROPYLENE OXIDE and 2983 ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE of Class 3.
- Remark 32:** Reference shall be made in column (20) to remark 32 for transport of UN No. 2448 SULPHUR, MOLTEN, of Class 4.1.
- Remark 33:** Reference shall be made in column (20) to remark 33 for transport of UN Nos. 2014 and 2984 HYDROGEN PEROXIDE, AQUEOUS SOLUTION, of Class 5.1.
- Remark 34:** Reference shall be made in column (20) to remark 34 for transport of substances for which hazard 8 is mentioned in column (5) and type N in column (6).
- Remark 35:** Reference shall be made in column (20) to remark 35 for substances that must not have a direct system for the refrigeration system.
- Remark 36:** Reference shall be made in column (20) to remark 36 for substances that must have an indirect system for the refrigeration system.
- Remark 37:** Reference shall be made in column (20) to remark 37 for substances for which the cargo storage system must be capable of resisting the full vapour pressure of the cargo at the upper limits of the ambient design temperatures, whatever the system adopted for the boil-off gas.
- Remark 38:** Reference must be made in column (20) to remark 38 for mixtures with an initial melting point above 60 °C in accordance with ASTM D 86-01.

3.2.4 Modalities for the application of section 1.5.2 on special authorizations concerning transport in tank vessels

3.2.4.1 Model special authorization under section 1.5.2

**Special authorization
under 1.5.2 of ADN**

Under 1.5.2 of ADN, the transport in tank vessels of the substance specified in the annex to this special authorization shall be authorized in the conditions referred to therein.

Before transporting the substance, the carrier shall be required to have it added to the list referred to in 1.16.1.2.5 of ADN by a recognized classification society.

This special authorization shall be valid
(places and/or routes of validity)

It shall be valid for two years from the date of signature, unless it is repealed at an earlier date.

Issuing State:

Competent authority:

Date:

Signature:

3.2.4.2 Application form for special authorizations under section 1.5.2

For applications for special authorizations, please answer the following questions and points.* Data are used for administrative purposes only and are treated confidentially.

Applicant

.....
 (Name) (Company)

.....
 ()

.....
 (Address)

Summary of the application

Authorization for transport in tank vessels of as a substance of Class

Annexes

(with brief description)

Application made:

At:

Date:

Signature:
 (of the person responsible for the data)

1. General data on the dangerous substance

1.1 Is it a pure substance , a mixture , a solution ?

1.2 Technical name (if possible ADN nomenclature or possibly the IBC Code).

1.3 Synonym.

1.4 Trade name.

1.5 Structure formula and, for mixtures, composition and/or concentration.

1.6 Hazard class and, where applicable classification code, packing group.

1.7 UN No. or substance identification number (if known).

* For questions not relevant to the subject of the application, write "not applicable".

2. Physico-chemical properties

- 2.1 State during transport (e.g. gas, liquid, molten, ...).
- 2.2 Density of liquid at 20 ° C or at the transport temperature if the substance is to be heated or refrigerated during transport.
- 2.3 Transport temperature (for substances heated or refrigerated during transport).
- 2.4 Melting point or range ° C.
- 2.5 Boiling point or range ° C.
- 2.6 Vapour pressure at 15 ° C, 20 ° C, 30 ° C, 37.8 ° C, 50 ° C,
(for liquefied gases, vapour pressure at 70 ° C,) (for permanent gases, filling pressure at
15 ° C,).
- 2.7 Cubic expansion coefficient K⁻¹
- 2.8 Solubility in water at 20 ° C
Saturation concentration mg/l
or
Miscibility with water at 15 ° C
 Complete partial none
(If possible, in the case of solutions and mixtures, indicate concentration)
- 2.9 Colour.
- 2.10 Odour.
- 2.11 Viscosity mm²/s.
- 2.12 Flow time (ISO 2431-1996)s.
- 2.13 Solvent separation test
- 2.14 pH of the substance or aqueous solution (indicate concentration).
- 2.15 Other information.

3. Technical safety properties

- 3.1 Auto-ignition temperature in accordance with IEC 60079-4 (corresponds to DIN 51 794) ° C;
where applicable, indicate the temperature class in accordance with EN 50 014: 1994.
- 3.2 Flash-point

For flash-points up to 175 ° C

Closed-cup test methods - non-equilibrium procedure

ABEL method: EN ISO 13736:1997

ABEL-PENSKY method: DIN 51755-1:1974 and DIN 51755-2:1978 or AFNOR method: M07-019

PENSKY-MARTENS method: EN ISO 2719:2004
LUCHAIRE apparatus: French standard AFNOR T 60-103:1968

TAG method: ASTM D 56-02

Closed-cup test methods - equilibrium procedure

Rapid equilibrium procedure: EN ISO 3679:2004; ASTM D 3278-96:2004

Closed-cup equilibrium procedure: EN ISO 1523:2002; ASTM D 3941-90:2001

For flash-points above 175 ° C

In addition to the above-mentioned methods, the following open-cup test method may be applied:

CLEVELAND method: EN ISO 2592:2002; ASTM D 92-02b

3.3 Explosion limits:

Determination of upper and lower explosion limits in accordance with EN 1839:2004.

3.4 Maximum safe gap in accordance with IEC 60079-1:2003

3.5 Is the substance stabilized during transport? If so, provide data on the stabilizer:

.....

3.6 Decomposition products in the event of combustion on contact with air or under the influence of an external fire:

3.7 Is the substance fire intensifying?

3.8 Abrasion (corrosion) mm/year.

3.9 Does the substance react with water or moist air by releasing flammable or toxic gases? Yes/no.
Gases released:

3.10 Does the substance react dangerously in any other way?

3.11 Does the substance react dangerously when reheated?
Yes/no

4. Physiological hazards

4.1 LD₅₀ and/or LC₅₀ value. Necrosis value (where applicable, other toxicity criteria in accordance with 2.2.61.1 of ADN).

CMR properties according to Categories 1A and 1B of chapters 3.5, 3.6 and 3.7 of GHS

4.2 Does decomposition or reaction produce substances posing physiological hazards? (Indicate which substances where known)

4.3 Environmental properties (see 2.4.2.1 of ADN)

Acute toxicity:

LC₅₀ 96 hr for fish mg/l

EC₅₀ 48 hr for crustacea mg/l

E_rC₅₀ 72 hr for algae mg/l

Chronic toxicity:

NOEC mg/l

BCF mg/l or log K_{ow}

Easily biodegradable yes/no

5. Data on hazard potential

5.1 What specific damage is to be expected if the hazard characteristics produce their effect?

- Combustion
- Injury
- Corrosion
- Intoxication in the event of dermal absorption
- Intoxication in the event of absorption by inhalation
- Mechanical damage
- Destruction
- Fire
- Abrasion (corrosion to metals)
- Environmental pollution

6. Data on the transport equipment

6.1 Are particular loading requirements envisaged/necessary (what are they)?

7. Transport of dangerous substances in tanks

7.1 With which materials is the substance to be carried compatible?

8. Technical safety requirements

8.1 Taking into account the current state of science and technology, what safety measures are necessary in the light of the hazards posed by the substance or liable to arise in the course of the transport process as a whole?

8.2 Additional safety measures

Use of stationary or mobile techniques to measure flammable gases and flammable liquid vapours

Use of stationary or mobile techniques (toximeters) to measure concentrations of toxic substances

3.2.4.3 Criteria for assignment of substances

A. Columns (6), (7) and (8): Determination of the type of tank vessel

1. Gases (criteria according to 2.2.2 of ADN)

- Without refrigeration: type G pressure
- With refrigeration: type G refrigerated

2. Halogenated hydrocarbons

Substances that may only be transported in a stabilized state

Toxic substances (see 2.2.61.1 of ADN)

Flammable (flash-point < 23 °C) or corrosive substances (see 2.2.8 of ADN)

Substances with an auto-ignition temperature ≤ 200 °C

Substances with a flash-point < 23 °C and an explosivity range > 15 % at 20 °C

Benzene and mixtures of non-toxic and non-corrosive substances containing more than 10% benzene

Environmentally hazardous substances, Acute or Chronic Category 1 (group N1 in accordance with 2.2.9.1.10.2)

- Cargo tank internal pressure > 50 kPa at the following temperatures: liquid 30 °C, gaseous phase 37.8 °C
 - Without refrigeration: type C pressure (400 kPa)
 - With refrigeration: type C refrigerated
- Cargo tank internal pressure ≤ 50 kPa at the following temperatures: liquid 30 °C, gaseous phase 37.8 °C but with cargo tank internal pressure > 50 kPa at 50 °C
 - Without water spraying: type C pressure (400 kPa)
 - With water spraying: type C with high-velocity vent valve opening pressure of 50 kPa
- Cargo tank internal pressure ≤ 50 kPa at the following temperatures: liquid 30°C, gaseous phase 37.8 °C with cargo tank internal pressure ≤ 50 kPa at 50°C
 - type C with high-velocity vent valve opening pressure as calculated, but at least 10 kPa

2.1 Mixtures for which type C is required in accordance with the criteria referred to in 2 above but for which certain data are lacking

In cases where the internal pressurization of the tank cannot be calculated owing to a lack of data, the following criteria may be used

- Initial boiling point ≤ 60 °C type C (400 kPa)
- 60 °C < initial boiling point ≤ 85 °C type C with high-velocity vent valve opening pressure of 50 kPa and with water spraying
- 85 °C < initial boiling point ≤ 115 °C type C with high-velocity vent

- | | | | |
|---|--------------------------------|--------|---|
| – | 115 °C < initial boiling point | type C | valve opening pressure of 50 kPa with high-velocity vent valve opening pressure of 35 kPa |
|---|--------------------------------|--------|---|

3. Substances which are flammable only (see 2.2.3 of ADN)

- | | | | |
|---|--|--|---|
| – | Flash-point < 23 °C
with 175 kPa ≤ Pv 50 < 300 kPa | <ul style="list-style-type: none"> • Without refrigeration: closed type N • With refrigeration: closed type N | pressure (400 kPa) refrigerated with high-velocity vent valve opening pressure of 50 kPa |
| – | Flash-point < 23 °C
with 150 kPa ≤ Pv 50 < 175 kPa: | closed type N | with eductor opening pressure of 50 kPa |
| – | Flash-point < 23 °C
with 110 kPa ≤ Pv 50 < 150 kPa | <ul style="list-style-type: none"> • Without water spraying: closed type N • Without water spraying: closed type N | with high-velocity vent valve opening pressure of Pa with high-velocity vent valve opening pressure of 10 kPa |
| – | Flash-point < 23 °C
with Pv 50 < 110 kPa: | closed type N | with high-velocity vent valve opening pressure of 10 kPa |
| – | Flash-point ≥ 23 °C but ≤ 60 °C: | open type N | with flame-arrester |
| – | Substances with a flash-point > 60 °C heated to less than 15 K from the flash-point, N.O.S. (...): | open type N | with flame-arrester |
| – | Substances with a flash-point > 60 °C heated to or less than the flash-point, N.O.S. (...): | open type N | with flame-arrester |

4. Corrosive substances (see 2.2.8.1 of ADN)

- | | | | |
|---|---|---------------|--|
| – | Corrosive substances liable to produce corrosive vapours | | |
| • | Substances assigned to packing group I or II in the list of substances and having a vapour pressure ¹ greater than 12.5 kPa valve (125 mbar) at 50 °C or | closed type N | cargo tank walls must be distinct from vessel hull; high-velocity vent valve/safety opening pressure of 10 kPa |
| • | Substances liable to react dangerously with water (for example acid chlorides) | | |
| • | Substances containing gases in solution | | |

¹ If the data are available, the sum of the partial pressures of the dangerous substances may be used in place of the vapour pressure.

- **Corrosive acids:**
 - Substances assigned to packing group I or II in the list of substances and having a vapour pressure* of 12.5 kPa (125 mbar) or less at 50 °C or open type N cargo tank walls must be distinct from vessel hull
 - Substances assigned to packing group III in the list of substances and having a vapour pressure* of 6.0 kPa (60 mbar) or greater at 50 °C or open type N cargo tank walls must be distinct from vessel hull
 - Substances assigned to packing group III in the list of substances because of their degree of corrosiveness to steel or aluminium or open type N cargo tank walls must be distinct from vessel hull
 - Substances with a melting point greater than 0 °C and transported at elevated temperatures open type N cargo tank walls must be distinct from vessel hull
 - Flammable substances open type N with flame-arresters
 - Elevated temperature substances open type N with flame-arresters
 - Non-flammable substances open type N without flame-arresters
- **All other corrosive substances:**
 - Flammable substance open type N with flame-arresters
 - Non-flammable substances open type N without flame-arresters

5. Environmentally hazardous substances (see 2.2.9.1 of ADN)

- Chronic 2 and (group N2 in accordance with 2.2.9.1.10.2) open type N cargo tank walls must be distinct from vessel hull
- Acute 2 and 3 (group N3 in accordance with 2.2.9.1.10.2) open type N _____

6. Substances of Class 9, UN No. 3257 open type N independent cargo tanks

7. Substances of Class 9, Identification No. 9003 open type N _____

Flash-point > 60 °C and ≤ 100 °C: open type N _____

8. Substances that must be transported at elevated temperatures

For substances that must be transported at elevated temperatures, the type of cargo tank shall be determined on the basis of the transport temperature, using the following table:

Maximum transport temperature T in °C	Type N	Type C
T ≤ 80	2	2
80 < T ≤ 115	1 + remark 25	1 + remark 26
T > 115	1	1

1 = cargo tank type: independent tank

2 = cargo tank type: integral tank

Remark 25 = remark No. 25 in column (20) of the list of substances contained in Chapter 3.2, Table C.

Remark 26 = remark No. 26 in column (20) of the list of substances contained in Chapter 3.2, Table C.

9. Substances with long-term effects on health - CMR substances (Categories 1A and 1B in accordance with the criteria of chapters 3.5, 3.6 and 3.7 of GHS²), provided that they are already assigned to Classes 2 to 9 by virtue of other criteria

C carcinogenic

M mutagenic

R toxic to reproduction

closed type N

cargo tank walls must be distinct from vessel hull; high-velocity vent valve opening pressure of at least 10 kPa, with water-spray system, if the internal pressurization of the tank is more than 10 kPa (calculation of the vapour pressure according to the formula for column 10, except that $V_a = 0.03$)

10. Substances that float on the water surface ('floaters') or sink to the bottom of the water ('sinters') (criteria in accordance with GESAMP),³ provided that they are already assigned to Classes 3 to 9 and that type N is required on that basis

closed type N

cargo tank walls must be distinct from vessel hull

B. Column (9): Determination of state of cargo tank

(1) Refrigeration system

Determined in accordance with A.

(2) Possibility of heating the cargo

A possibility of heating the cargo shall be required:

- When the melting point of the substance to be transported is + 15 °C or greater, or
- When the melting point of the substance to be transported is greater than 0 °C but less than + 15 °C and the outside temperature is no more than 4 K above the melting point. In column (20), reference shall be made to remark 6 with the temperature derived as follows: melting point + 4 K.

(3) Water-spray system

² Since there is no official international list of CMR substances of Categories 1A and 1B, pending the availability of such a list, the list of CMR substances of Categories 1 and 2 in Directives 67/548/EEC and 88/379/EEC of the Council of the European Union, as amended, shall apply.

³ IMO publication: "The Revised GESAMP Hazard Evaluation Procedure for Chemical Substances Carried by Ships", GESAMP Reports and Studies No. 64, IMO, London, 2002.

Determined in accordance with A.

(4) Cargo heating system on board

- For substances that must not be allowed to solidify owing to the possibility of dangerous reactions on reheating, and
- For substances that must be maintained at a guaranteed temperature of not less than 15 K below their flash-point.

C. Column (10): Determination of opening pressure of high-velocity vent valve in kPa

For vessels of type C, the opening pressure of the high-velocity vent valve shall be determined on the basis of the internal pressure of the tanks, rounded up to the nearest 5 kPa.

To calculate the internal pressure, the following formula shall be used:

$$P_{\max} = P_{Ob\max} + \frac{k V_a (P_0 - P_{Da})}{v_a - \alpha \delta_t + \alpha \delta_t v_a} - P_0$$

$$k = \frac{T_{D\max}}{T_a}$$

In this formula:

P_{\max} : Maximum internal pressure in kPa

$P_{Ob\max}$: Vapour pressure at maximum absolute liquid surface temperature in kPa

P_{Da} : Vapour pressure at absolute filling temperature in kPa

P_0 : Atmospheric pressure in kPa

v_a : Free relative volume at filling temperature compared with cargo tank volume

α : Cubic expansion coefficient in K^{-1}

δ_t : Average liquid temperature increase through reheating in K

$T_{D\max}$: Maximum absolute vapour pressure in K

T_a : Filling temperature in K

k : Temperature correction factor

t_{Ob} : Maximum liquid surface temperature in $^{\circ}C$

In the formula, the following basic data are used:

$P_{Ob\max}$: At 50 $^{\circ}C$ and 30 $^{\circ}C$

P_{Da} : At 15 $^{\circ}C$

P_0 : 101.3 kPa

v_a : 5% = 0.05

δ_t : 5 K

$T_{D\max}$: 323 K and 310.8 K

T_a : 288 K

t_{Ob} : 50 °C and 30 °C

D. Column (11): Determination of maximum degree of filling of cargo tanks

If, in accordance with the provisions under A above:

- Type G is required: 91% however, in the case of deeply refrigerated substances: 95%
- Type C is required: 95%
- Type N is required: 97% however, in the case of substances in a molten state and of flammable liquids with $5 \text{ kPa} \leq P_{v50} < 300 \text{ kPa}$: 95%.

E. Column (13): Determination of type of sampling connection

- 1 = closed:
- Substances to be transported in pressure cargo tanks
 - Substances with T in column (3b) and assigned to packing group I
 - Stabilized substances to be transported under inert gas.
- 2 = partly closed:
- All other substances for which type C is required
- 3 = open:
- All other substances

(F) Column (14): Determination of whether a pump-room is permitted below deck

- No
- All substances with letter T in the classification code indicated in column (3b) with the exception of substances of Class 2.
- Yes
- All other substances

(G) Column (15): Determination of temperature class

Flammable substances shall be assigned to a temperature class on the basis of their auto-ignition point:

Temperature class	Auto-ignition temperature T of flammable liquids and gases in °C
T1	$T > 450$
T2	$300 < T \leq 450$
T3	$200 < T \leq 300$
T4	$135 < T \leq 200$
T5	$100 < T \leq 135$
T6	$85 < T \leq 100$

When anti-explosion protection is required and the auto-ignition temperature is not known, reference shall be made to temperature class T4, considered safe.

(H) Column (16): Determination of explosion group

Flammable substances shall be assigned to an explosion group on the basis of their maximum experimental safe gaps. The maximum experimental safe gaps shall be determined in accordance with the standard contained in IEC Publication No. 79-1A.

The different explosion groups are as follows:

Explosion group	Maximum experimental safe gap in mm
II A	> 0.9

II B	≥ 0.5 to ≤ 0.9
II C	< 0.5

When anti-explosion protection is required and the relevant data are not provided, reference shall be made to explosion group II B, considered safe.

(I) Column (17): Determination of whether anti-explosion protection is required for electrical equipment and systems

- | | |
|-----|--|
| Yes | - Substances with a flash-point ≤ 60 °C.
- Substances that must be transported while heated to a temperature less than 15 K from their flash-point.
- Flammable gases |
| No | - All other substances |

(J) Column (18): Determination of whether personal protective equipment, escape devices, portable flammable gas detectors, portable toximeters or ambient-air-dependent breathing apparatus is required

- PP: For all substances of Classes 1 to 9;
- EP: For all substances
 - of Class 2 with letter T or letter C in the classification code indicate in column (3b);
 - of Class 3 with letter T or letter C in the classification code indicated in column (3b);
 - of Class 4.1;
 - of Class 6.1;
 - of Class 8; and
 for CMR substances of Category 1A or 1B according to chapters 3.5, 3.6 and 3.7 of GHS;
- EX: For all substances for which anti-explosion protection is required;
- TOX: For all substances of Class 6.1;
For all substances of other classes with T in column (3b);
For CMR substances of Category 1A or 1B according to chapters 3.5, 3.6 and 3.7 of GHS;
- A: For all substances for which EX or TOX is required.

(K) Column (19): Determination of the number of cones or blue lights

- | | |
|---|----------------|
| For all substances of Class 2 with letter F in the classification code indicated in column (3b): | 1 cone/light |
| For all substances of Classes 3 to 9 with letter F in the classification code indicated in column (3b) and assigned to packing group I or II: | 1 cone/light |
| For all substances of Class 2 with letter T in the classification code indicated in column (3b): | 2 cones/lights |
| For all substances of Classes 3 to 9 with letter T in the classification code indicated in column (3b) and assigned to packing group I or II: | 2 cones/lights |

(L) Column (20): Determination of additional requirements and remarks

Remark 1: Reference shall be made in column (20) to remark 1 for transport of UN No. 1005 AMMONIA, ANHYDROUS.

- Remark 2:** Reference shall be made in column (20) to remark 2 for stabilized substances that react with oxygen.
- Remark 3:** Reference shall be made in column (20) to remark 3 for substances that must be stabilized.
- Remark 4:** Reference shall be made in column (20) to remark 4 for substances that must not be allowed to solidify owing to the possibility of dangerous reactions on reheating.
- Remark 5:** Reference shall be made in column (20) to remark 5 for substances liable to polymerization.
- Remark 6:** Reference shall be made in column (20) to remark 6 for substances liable to crystallization and for substances for which a heating system or possibility of heating is required and the vapour pressure of which at 20 °C is greater than 0.1 kPa.
- Remark 7:** Reference shall be made in column (20) to remark 7 for substances with a flash-point of + 15 °C or greater.
- Remark 8:** Reference shall be made in column (20) to remark 8 for substances that react dangerously with water.
- Remark 9:** Reference shall be made in column (20) to remark 9 for transport of UN No. 1131 CARBON DISULPHIDE.
- Remark 10:** *No longer used.*
- Remark 11:** Reference shall be made in column (20) to remark 11 for transport of UN No. 1040 ETHYLENE OXIDE WITH NITROGEN.
- Remark 12:** Reference shall be made in column (20) to remark 12 for transport of UN No. 1280 PROPYLENE OXIDE and UN No. 2983 ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE.
- Remark 13:** Reference shall be made in column (20) to remark 13 for transport of UN No. 1086 VINYL CHLORIDE, STABILIZED.
- Remark 14:** Reference shall be made in column (20) to remark 14 for mixtures or N.O.S. entries which are not clearly defined and for which type N is stipulated under the classification criteria.
- Remark 15:** Reference shall be made in column (20) to remark 15 for substances that react dangerously with alkalis or acids such as sodium hydroxide or sulphuric acid.
- Remark 16:** Reference shall be made in column (20) to remark 16 for substances that may react dangerously to local overheating.
- Remark 17:** Reference shall be made in column (20) to remark 17 when reference is made to remark 6 or 7.
- Remark 18:** *No longer used.*
- Remark 19:** Reference shall be made in column (20) to remark 19 for substances that must under no circumstances come into contact with water.
- Remark 20:** Reference shall be made in column (20) to remark 20 for substances the transport temperature of which must not exceed a maximum temperature in combination with the cargo tank materials. Reference shall be made to this maximum permitted temperature immediately after the number 20.
- Remark 21:** *No longer used.*

- Remark 22:** Reference shall be made in column (20) to remark 22 for substances for which a range of values or no value is indicated in column (11).
- Remark 23:** Reference shall be made in column (20) to remark 23 for substances the internal pressure of which at 30 °C is less than 50 kPa and which are transported with water spraying.
- Remark 24:** Reference shall be made in column (20) to remark 24 for transport of UN No. 3257 ELEVATED TEMPERATURE LIQUID, N.O.S.
- Remark 25:** Reference shall be made in column (20) to remark 25 for substances that must be transported while heated in a type 3 cargo tank.
- Remark 26:** Reference shall be made in column (20) to remark 26 for substances that must be transported while heated in a type 2 cargo tank.
- Remark 27:** Reference shall be made in column (20) to remark 27 for substances for which the reference N.O.S. or a generic reference is made in column (2).
- Remark 28:** Reference shall be made in column (20) to remark 28 for transport of UN No. 2448 SULPHUR, MOLTEN.
- Remark 29:** Reference shall be made in column (20) to remark 29 for substances for which the vapour pressure or boiling point is indicated in column (2).
- Remark 30:** Reference shall be made in column (20) to remark 30 for transport of UN Nos. 1719, 1794, 1814, 1819, 1824, 1829, 1830, 1832, 1833, 1906, 2240, 2308, 2583, 2584, 2677, 2679, 2681, 2796, 2797, 2837 and 3320 under the entries for which open type N is required.
- Remark 31:** Reference shall be made in column (20) to remark 31 for transport of substances of Class 2 and UN Nos. 1280 PROPYLENE OXIDE and 2983 ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE of Class 3.
- Remark 32:** Reference shall be made in column (20) to remark 32 for transport of UN No. 2448 SULPHUR, MOLTEN, of Class 4.1.
- Remark 33:** Reference shall be made in column (20) to remark 33 for transport of UN Nos. 2014 and 2984 HYDROGEN PEROXIDE, AQUEOUS SOLUTION, of Class 5.1.
- Remark 34:** Reference shall be made in column (20) to remark 34 for transport of substances for which hazard 8 is mentioned in column (5) and type N in column (6).
- Remark 35:** Reference shall be made in column (20) to remark 35 for substances that must not have a direct system for the refrigeration system.
- Remark 36:** Reference shall be made in column (20) to remark 36 for substances that must have an indirect system for the refrigeration system.
- Remark 37:** Reference shall be made in column (20) to remark 37 for substances for which the cargo storage system must be capable of resisting the full vapour pressure of the cargo at the upper limits of the ambient design temperatures, whatever the system adopted for the boil-off gas.
- Remark 38:** Reference must be made in column (20) to remark 38 for mixtures with an initial melting point above 60 °C in accordance with ASTM D 86-01.

CHAPTER 3.3**SPECIAL PROVISIONS APPLICABLE TO CERTAIN ARTICLES OR SUBSTANCES**

3.3.1 When Column (6) of Table A of Chapter 3.2 indicates that a special provision is relevant to a substance or article, the meaning and requirements of that special provision are as set forth below.

- 16 Samples of new or existing explosive substances or articles may be carried as directed by the competent authorities (see 2.2.1.1.3) for purposes including: testing, classification, research and development, quality control, or as a commercial sample. Explosive samples which are not wetted or desensitised shall be limited to 10 kg in small packages as specified by the competent authorities. Explosive samples which are wetted or desensitised shall be limited to 25 kg.
- 23 Even though this substance has a flammability hazard, it only exhibits such hazard under extreme fire conditions in confined areas.
- 32 This substance is not subject to the requirements of ADN when in any other form.
- 37 This substance is not subject to the requirements of ADN when coated.
- 38 This substance is not subject to the requirements of ADN when it contains not more than 0.1% calcium carbide.
- 39 This substance is not subject to the requirements of ADN when it contains less than 30% or not less than 90% silicon.
- 43 When offered for carriage as pesticides, these substances shall be carried under the relevant pesticide entry and in accordance with the relevant pesticide provisions (see 2.2.61.1.10 to 2.2.61.1.11.2).
- 45 Antimony sulphides and oxides which contain not more than 0.5% of arsenic calculated on the total mass are not subject to the requirements of ADN.
- 47 Ferricyanides and ferrocyanides are not subject to the requirements of ADN.
- 48 The carriage of this substance, when it contains more than 20% hydrocyanic acid, is prohibited.
- 59 These substances are not subject to the requirements of ADN when they contain not more than 50% magnesium.
- 60 If the concentration is more than 72%, the carriage of this substance is prohibited.
- 61 The technical name which shall supplement the proper shipping name shall be the ISO common name (see also ISO 1750:1981 "*Pesticides and other*

- agrochemicals - common names*", as amended), other name listed in the WHO "Recommended Classification of Pesticides by Hazard and Guidelines to Classification" or the name of the active substance (see also 3.1.2.8.1 and 3.1.2.8.1.1).
- 62 This substance is not subject to the requirements of ADN when it contains not more than 4% sodium hydroxide.
- 65 Hydrogen peroxide aqueous solutions with less than 8% hydrogen peroxide are not subject to the requirements of ADN.
- 103 The carriage of ammonium nitrites and mixtures of an inorganic nitrite with an ammonium salt is prohibited.
- 105 Nitrocellulose meeting the descriptions of UN No. 2556 or UN No. 2557 may be classified in Class 4.1.
- 113 The carriage of chemically unstable mixtures is prohibited.
- 119 Refrigerating machines include machines or other appliances which have been designed for the specific purpose of keeping food or other items at a low temperature in an internal compartment, and air conditioning units. Refrigerating machines and refrigerating machine components are not subject to the provisions of ADN if they contain less than 12 kg of gas in Class 2, group A or O according to 2.2.2.1.3, or if they contain less than 12 litres ammonia solution (UN No. 2672).
- 122 The subsidiary risks, control and emergency temperatures if any, and the UN number (generic entry) for each of the currently assigned organic peroxide formulations are given in 2.2.52.4.
- 127 Other inert material or inert material mixture may be used, provided this inert material has identical phlegmatizing properties.
- 131 The phlegmatized substance shall be significantly less sensitive than dry PETN.
- 135 The dihydrated sodium salt of dichloroisocyanuric acid is not subject to the requirements of ADN.
- 138 p-Bromobenzyl cyanide is not subject to the requirements of ADN.
- 141 Products which have undergone sufficient heat treatment so that they present no hazard during carriage are not subject to the requirements of ADN.
- 142 Solvent extracted soya bean meal containing not more than 1.5% oil and 11% moisture, which is substantially free of flammable solvent, is not subject to the requirements of ADN.
- 144 An aqueous solution containing not more than 24% alcohol by volume is not subject to the requirements of ADN.

- 145 Alcoholic beverages of packing group III, when carried in receptacles of 250 litres or less, are not subject to the requirements of ADN.
- 152 The classification of this substance will vary with particle size and packaging, but borderlines have not been experimentally determined. Appropriate classifications shall be made in accordance with 2.2.1.
- 153 This entry applies only if it is demonstrated, on the basis of tests, that the substances when in contact with water are not combustible nor show a tendency to auto-ignition and that the mixture of gases evolved is not flammable.
- 163 A substance mentioned by name in Table A of Chapter 3.2 shall not be carried under this entry. Substances carried under this entry may contain 20% or less nitrocellulose provided the nitrocellulose contains not more than 12.6% nitrogen (by dry mass).

168 Asbestos which is immersed or fixed in a natural or artificial binder (such as cement, plastics, asphalt, resins or mineral ore) in such a way that no escape of hazardous quantities of respirable asbestos fibres can occur during carriage is not subject to the requirements of ADN. Manufactured articles containing asbestos and not meeting this provision are nevertheless not subject to the requirements of ADN when packed so that no escape of hazardous quantities of respirable asbestos fibres can occur during carriage.

- 169 Phthalic anhydride in the solid state and tetrahydrophthalic anhydrides, with not more than 0.05% maleic anhydride, are not subject to the requirements of ADN. Phthalic anhydride molten at a temperature above its flash-point, with not more than 0.05% maleic anhydride, shall be classified under UN No. 3256.

- 172 For radioactive material with a subsidiary risk:

- (a) The packages shall be labelled with a label corresponding to each subsidiary risk exhibited by the material; corresponding placards shall be affixed to vehicles, wagons or containers in accordance with the relevant provisions of 5.3.1;
- (b) The radioactive material shall be allocated to packing groups I, II or III, as and if appropriate, by application of the grouping criteria provided in Part 2 corresponding to the nature of the predominant subsidiary risk.

The description required in 5.4.1.2.5.1 (b) shall include a description of these subsidiary risks (e.g. "Subsidiary risk: 3, 6.1"), the name of the constituents which most predominantly contribute to this (these) subsidiary risk(s), and where applicable, the packing group.

- 177 Barium sulphate is not subject to the requirements of ADN.

- 178 This designation shall be used only when no other appropriate designation exists in Table A of Chapter 3.2, and only with the approval of the competent authority of the country of origin (see 2.2.1.1.3).
- 181 Packages containing this type of substance shall bear a label conforming to model No. 1 (see 5.2.2.2.2) unless the competent authority of the country of origin has permitted this label to be dispensed with for the specific packaging employed because test data have proved that the substance in this packaging does not exhibit explosive behaviour (see 5.2.2.1.9).
- 182 The group of alkali metals includes lithium, sodium, potassium, rubidium and caesium.
- 183 The group of alkaline earth metals includes magnesium, calcium, strontium and barium.
- 186 In determining the ammonium nitrate content, all nitrate ions for which a molecular equivalent of ammonium ions is present in the mixture shall be calculated as ammonium nitrate.
- 188 Cells and batteries offered for carriage are not subject to other provisions of ADN if they meet the following:
- (a) For a lithium metal or lithium alloy cell, the lithium content is not more than 1 g, and for a lithium-ion cell, the Watt-hour rating is not more than 20 Wh;
 - (b) For a lithium metal or lithium alloy battery the aggregate lithium content is not more than 2 g, and for a lithium-ion battery, the Watt-hour rating is not more than 100 Wh. Lithium ion batteries subject to this provision shall be marked with the Watt-hour rating on the outside case, except those manufactured before 1 January 2009 which may be carried in accordance with this special provision and without this marking until 31 December 2010;
 - (c) Each cell or battery is of the type proved to meet the requirements of each test in the *Manual of Tests and Criteria*, Part III, sub-section 38.3;
 - (d) Cells and batteries, except when installed in equipment, shall be packed in inner packagings that completely enclose the cell or battery. Cells and batteries shall be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit. The inner packagings shall be packed in strong outer packagings which conform to the provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.5 of ADR;
 - (e) Cells and batteries when installed in equipment shall be protected from damage and short circuit, and the equipment shall be equipped with an effective means of preventing accidental activation. When batteries are installed in equipment, the equipment shall be packed in strong outer packagings constructed of suitable material of adequate strength and

design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained;

- (f) Except for packages containing no more than four cells installed in equipment or no more than two batteries installed in equipment, each package shall be marked with the following:
 - (i) an indication that the package contains "lithium metal" or "lithium ion" cells or batteries, as appropriate;
 - (ii) an indication that the package shall be handled with care and that a flammability hazard exists if the package is damaged;
 - (iii) an indication that special procedures shall be followed in the event the package is damaged, to include inspection and repacking if necessary; and
 - (iv) a telephone number for additional information;
- (g) Each consignment of one or more packages marked in accordance with paragraph (f) shall be accompanied with a document including the following:
 - (i) an indication that the package contains "lithium metal" or "lithium ion" cells or batteries, as appropriate;
 - (ii) an indication that the package shall be handled with care and that a flammability hazard exists if the package is damaged;
 - (iii) an indication that special procedures shall be followed in the event the package is damaged, to include inspection and repacking if necessary; and
 - (iv) a telephone number for additional information;
- (h) Except when batteries are installed in equipment, each package shall be capable of withstanding a 1.2 m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the contents so as to allow battery to battery (or cell to cell) contact and without release of contents; and
- (i) Except when batteries are installed in or packed with equipment, packages shall not exceed 30 kg gross mass.

As used above and elsewhere in ADN, "lithium content" means the mass of lithium in the anode of a lithium metal or lithium alloy cell.

Separate entries exist for lithium metal batteries and lithium ion batteries to facilitate the carriage of these batteries for specific modes of carriage and to enable the application of different emergency response actions.

- 190 Aerosol dispensers shall be provided with protection against inadvertent discharge. Aerosols with a capacity not exceeding 50 ml containing only non-toxic constituents are not subject to the requirements of ADN.
- 191 Receptacles, small, with a capacity not exceeding 50 ml, containing only non-toxic constituents are not subject to the requirements of ADN.
- 193 This entry may only be used for uniform ammonium nitrate based fertilizer mixtures of the nitrogen, phosphate or potash type, containing not more than 70% ammonium nitrate and not more than 0.4% total combustible/organic material calculated as carbon or with not more than 45% ammonium nitrate and unrestricted combustible material. Fertilizers within these composition limits are not subject to the requirements of ADN if shown by a Trough Test (see *Manual of Tests and Criteria*, Part III, sub-section 38.2) not to be liable to self-sustaining decomposition.
- 194 The control and emergency temperatures, if any, and the UN number (generic entry) for each of the currently assigned self-reactive substances are given in 2.2.41.4.
- 196 Formulations which in laboratory testing neither detonate in the cavitated state nor deflagrate, which show no effect when heated under confinement and which exhibit no explosive power may be carried under this entry. The formulation must also be thermally stable (i.e. the SADT is 60 °C or higher for a 50 kg package). Formulations not meeting these criteria shall be carried under the provisions of Class 5.2, (see 2.2.52.4).
- 198 Nitrocellulose solutions containing not more than 20 % nitrocellulose may be carried as paint or printing ink, as applicable (see UN Nos. 1210, 1263, 3066, 3469 and 3470).
- 199 Lead compounds which, when mixed in a ratio of 1:1000 with 0.07M hydrochloric acid and stirred for one hour at a temperature of 23 °C ± 2 °C, exhibit a solubility of 5 % or less (see ISO 3711:1990 "*Lead chromate pigments and lead chromate-molybdate pigments – Specifications and methods of test*") are considered insoluble and are not subject to the requirements of ADN unless they meet the criteria for inclusion in another class.
- 201 Lighters and lighter refills shall comply with the provisions of the country in which they were filled. They shall be provided with protection against inadvertent discharge. The liquid portion of the gas shall not exceed 85% of the capacity of the receptacle at 15 °C. The receptacles, including the closures, shall be capable of withstanding an internal pressure of twice the pressure of the liquefied petroleum gas at 55 °C. The valve mechanisms and ignition devices shall be securely sealed, taped or otherwise fastened or designed to prevent operation or leakage of the contents during carriage. Lighters shall not contain more than 10 g of liquefied petroleum gas. Lighter refills shall not contain more than 65 g of liquefied petroleum gas.

NOTE: For waste lighters collected separately see Chapter 3.3, special provision 654.

- 203 This entry shall not be used for polychlorinated biphenyls, liquid, UN No. 2315 and polychlorinated biphenyls, solid, UN No. 3432.
- 205 This entry shall not be used for UN No. 3155 PENTACHLOROPHENOL.
- 207 Polymeric beads and moulding compounds may be made from polystyrene, poly(methyl methacrylate) or other polymeric material.
- 208 The commercial grade of calcium nitrate fertilizer, when consisting mainly of a double salt (calcium nitrate and ammonium nitrate) containing not more than 10% ammonium nitrate and at least 12% water of crystallization, is not subject to the requirements of ADN.
- 210 Toxins from plant, animal or bacterial sources which contain infectious substances, or toxins that are contained in infectious substances, shall be classified in Class 6.2.
- 215 This entry only applies to the technically pure substance or to formulations derived from it having an SADT higher than 75 °C and therefore does not apply to formulations which are self-reactive substances (for self-reactive substances, see 2.2.41.4). Homogeneous mixtures containing not more than 35 % by mass of azodicarbonamide and at least 65 % of inert substance are not subject to the requirements of ADN unless criteria of other classes are met.
- 216 Mixtures of solids which are not subject to the requirements of ADN and flammable liquids may be carried under this entry without first applying the classification criteria of Class 4.1, provided there is no free liquid visible at the time the substance is loaded or at the time the packaging, vehicle, wagon or container is closed. Sealed packets and articles containing less than 10 ml of a packing group II or III flammable liquid absorbed into a solid material are not subject to ADN provided there is no free liquid in the packet or article.
- 217 Mixtures of solids which are not subject to the requirements of ADN and toxic liquids may be carried under this entry without first applying the classification criteria of Class 6.1, provided there is no free liquid visible at the time the substance is loaded or at the time the packaging, vehicle, wagon or container is closed. This entry shall not be used for solids containing a packing group I liquid.
- 218 Mixtures of solids which are not subject to the requirements of ADN and corrosive liquids may be carried under this entry without first applying the classification criteria of Class 8, provided there is no free liquid visible at the time the substance is loaded or at the time the packaging, vehicle, wagon or container is closed.
- 219 Genetically modified micro-organisms and genetically modified organisms which meet the definition of an infectious substance and the criteria for

- inclusion in Class 6.2 in accordance with section 2.2.62 shall be carried as UN No. 2814, UN No. 2900 or UN No. 3373, as appropriate.
- 220 Only the technical name of the flammable liquid component of this solution or mixture shall be shown in parentheses immediately following the proper shipping name.
- 221 Substances included under this entry shall not be of packing group I.
- 224 Unless it can be demonstrated by testing that the sensitivity of the substance in its frozen state is no greater than in its liquid state, the substance shall remain liquid during normal transport conditions. It shall not freeze at temperatures above -15 °C.
- 225 Fire extinguishers under this entry may include installed actuating cartridges (cartridges, power device of classification code 1.4C or 1.4S), without changing the classification of Class 2, group A or O according to 2.2.2.1.3 provided the total quantity of deflagrating (propellant) explosives does not exceed 3.2 g per extinguishing unit.
- 226 Formulations of this substance containing not less than 30% non-volatile, non-flammable phlegmatizer are not subject to the requirements of ADN.
- 227 When phlegmatized with water and inorganic inert material the content of urea nitrate may not exceed 75% by mass and the mixture shall not be capable of being detonated by the Series 1, type (a), test in the *Manual of Tests and Criteria*, Part 1.
- 228 Mixtures not meeting the criteria for flammable gases (see 2.2.2.1.5) shall be carried under UN No. 3163.
- 230 This entry applies to cells and batteries containing lithium in any form, including lithium polymer and lithium ion cells and batteries.

Lithium cells and batteries may be carried under this entry if they meet the following provisions:

- (a) Each cell or battery is of the type proved to meet the requirements of each test of the *Manual of Tests and Criteria*, Part III, sub-section 38.3;
- (b) Each cell and battery incorporates a safety venting device or is designed to preclude a violent rupture under normal conditions of carriage;
- (c) Each cell and battery is equipped with an effective means of preventing external short circuits;
- (d) Each battery containing cells or series of cells connected in parallel is equipped with effective means as necessary to prevent dangerous reverse current flow (e.g. diodes, fuses, etc.).

- 235 This entry applies to articles which contain Class 1 explosive substances and which may also contain dangerous goods of other classes. These articles are used as life-saving vehicle air bag inflators or air bag modules or seat-belt pretensioners.
- 236 Polyester resin kits consist of two components: a base material (Class 3, packing group II or III) and an activator (organic peroxide). The organic peroxide shall be type D, E or F, not requiring temperature control. Packing group shall be II or III, according to the criteria for Class 3, applied to the base material. The quantity limit referred to in Column (7a) of Table A of Chapter 3.2 applies to the base material.
- 237 The membrane filters, including paper separators, coating or backing materials, etc., that are present in carriage, shall not be liable to propagate a detonation as tested by one of the tests described in the *Manual of Tests and Criteria*, Part I, Test series 1 (a).

In addition the competent authority may determine, on the basis of the results of suitable burning rate tests taking account of the standard tests in the *Manual of Tests and Criteria*, Part III, sub-section 33.2.1, that nitrocellulose membrane filters in the form in which they are to be carried are not subject to the requirements applicable to flammable solids in Class 4.1.

- 238 (a) Batteries can be considered as non-spillable provided that they are capable of withstanding the vibration and pressure differential tests given below, without leakage of battery fluid.

Vibration test: The battery is rigidly clamped to the platform of a vibration machine and a simple harmonic motion having an amplitude of 0.8 mm (1.6 mm maximum total excursion) is applied. The frequency is varied at the rate of 1 Hz/min between the limits of 10 Hz and 55 Hz. The entire range of frequencies and return is traversed in 95 ± 5 minutes for each mounting position (direction of vibration) of the battery. The battery is tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods.

Pressure differential test: Following the vibration test, the battery is stored for six hours at $24 \text{ °C} \pm 4 \text{ °C}$ while subjected to a pressure differential of at least 88 kPa. The battery is tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for at least six hours in each position.

- (b) Non-spillable batteries are not subject to the requirements of ADN if, at a temperature of 55 °C , the electrolyte will not flow from a ruptured or cracked case and there is no free liquid to flow and if, as packaged for carriage, the terminals are protected from short circuit.
- 239 Batteries or cells shall not contain dangerous substances other than sodium, sulphur and/or polysulphides. Batteries or cells shall not be offered for carriage at a temperature such that liquid elemental sodium is present in the battery or cell unless approved and under the conditions established by the competent

authority of the country of origin. If the country of origin is not a Contracting Party to ADN, the approval and conditions of carriage shall be recognized by the competent authority of the first country Contracting Party to ADN reached by the consignment.

Cells shall consist of hermetically sealed metal casings which fully enclose the dangerous substances and which are so constructed and closed as to prevent the release of the dangerous substances under normal conditions of carriage.

Batteries shall consist of cells secured within and fully enclosed by a metal casing so constructed and closed as to prevent the release of the dangerous substances under normal conditions of carriage.

241 The formulation shall be prepared so that it remains homogeneous and does not separate during carriage. Formulations with low nitrocellulose contents and not showing dangerous properties when tested for their liability to detonate, deflagrate or explode when heated under defined confinement by tests of Test series 1 (a), 2 (b) and 2 (c) respectively in the *Manual of Tests and Criteria*, Part I and not being a flammable solid when tested in accordance with test No. 1 in the *Manual of Tests and Criteria*, Part III, sub-section 33.2.1.4 (chips, if necessary, crushed and sieved to a particle size of less than 1.25 mm) are not subject to the requirements of ADN.

242 Sulphur is not subject to the requirements of ADN when it has been formed to a specific shape (e.g. prills, granules, pellets, pastilles or flakes).

243 Gasoline, motor spirit and petrol for use in spark-ignition engines (e.g. in automobiles, stationary engines and other engines) shall be assigned to this entry regardless of variations in volatility.

244 This entry includes e.g. aluminium dross, aluminium skimmings, spent cathodes, spent potliner, and aluminium salt slags.

247 Alcoholic beverages containing more than 24% alcohol but not more than 70% by volume, when carried as part of the manufacturing process, may be carried in wooden barrels with a capacity of more than 250 litres and not more than 500 litres meeting the general requirements of 4.1.1 of ADR, as appropriate, on the following conditions:

- (a) The wooden barrels shall be checked and tightened before filling;
- (b) Sufficient ullage (not less than 3%) shall be left to allow for the expansion of the liquid;
- (c) The wooden barrels shall be carried with the bungholes pointing upwards;
- (d) The wooden barrels shall be carried in containers meeting the requirements of the CSC. Each wooden barrel shall be secured in

custom-made cradles and be wedged by appropriate means to prevent it from being displaced in any way during carriage.

- 249 Ferrocium, stabilized against corrosion, with a minimum iron content of 10% is not subject to the requirements of ADN.
- 250 This entry may only be used for samples of chemicals taken for analysis in connection with the implementation of the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction. The carriage of substances under this entry shall be in accordance with the chain of custody and security procedures specified by the Organisation for the Prohibition of Chemical Weapons.

The chemical sample may only be carried providing prior approval has been granted by the competent authority or the Director General of the Organisation for the Prohibition of Chemical Weapons and providing the sample complies with the following provisions:

- (a) It shall be packed according to packing instruction 623 in the ICAO Technical Instructions (see S-3-8 of the Supplement); and
 - (b) During carriage, a copy of the document of approval for transport, showing the quantity limitations and the packing provisions shall be attached to the transport document.
- 251 The entry CHEMICAL KIT or FIRST AID KIT is intended to apply to boxes, cases etc. containing small quantities of various dangerous goods which are used for example for medical, analytical or testing or repair purposes. Such kits may not contain dangerous goods for which the code "LQ0" has been indicated in Column (7a) of Table A of Chapter 3.2.

Components shall not react dangerously (see "dangerous reaction" in 1.2.1). The total quantity of dangerous goods in any one kit shall not exceed either 1 l or 1 kg. The packing group assigned to the kit as a whole shall be the most stringent packing group assigned to any individual substance in the kit.

Kits which are carried on board vessels for first-aid or operating purposes are not subject to the requirements of ADN.

Chemical kits and first aid kits containing dangerous goods in inner packagings which do not exceed the quantity limits for limited quantities applicable to individual substances as specified in Column (7a) of Table A of Chapter 3.2 in accordance with the LQ code defined in 3.4.6 may be carried in accordance with Chapter 3.4.

- 252 Provided the ammonium nitrate remains in solution under all conditions of carriage, aqueous solutions of ammonium nitrate, with not more than 0.2% combustible material, in a concentration not exceeding 80%, are not subject to the requirements of ADN.

- 266 This substance, when containing less alcohol, water or phlegmatizer than specified, shall not be carried unless specifically authorized by the competent authority (see 2.2.1.1).
- 267 Any explosives, blasting, type C containing chlorates shall be segregated from explosives containing ammonium nitrate or other ammonium salts.
- 270 Aqueous solutions of Class 5.1 inorganic solid nitrate substances are considered as not meeting the criteria of Class 5.1 if the concentration of the substances in solution at the minimum temperature encountered during carriage is not greater than 80% of the saturation limit.
- 271 Lactose or glucose or similar materials, may be used as a phlegmatizer provided that the substance contains not less than 90%, by mass, of phlegmatizer. The competent authority may authorize these mixtures to be classified in Class 4.1 on the basis of a test Series 6 (c) of Section 16 of Part I of the *Manual of Tests and Criteria* on at least three packages as prepared for carriage. Mixtures containing at least 98%, by mass, of phlegmatizer are not subject to the requirements of ADN. Packages containing mixtures with not less than 90%, by mass, of phlegmatizer need not bear a label conforming to model No. 6.1.
- 272 This substance shall not be carried under the provisions of Class 4.1 unless specifically authorized by the competent authority (see UN No. 0143).
- 273 Maneb and maneb preparations stabilized against self-heating need not be classified in Class 4.2 when it can be demonstrated by testing that a cubic volume of 1 m³ of substance does not self-ignite and that the temperature at the centre of the sample does not exceed 200 °C, when the sample is maintained at a temperature of not less than 75 °C ± 2 °C for a period of 24 hours.
- 274 The provisions of 3.1.2.8 apply.
- 278 These substances shall not be classified and carried unless authorized by the competent authority on the basis of results from Series 2 tests and a Series 6(c) test of Part I of the *Manual of Tests and Criteria* on packages as prepared for carriage (see 2.2.1.1). The competent authority shall assign the packing group on the basis of 2.2.3 criteria and the package type used for the Series 6(c) test.
- 279 The substance is assigned to this classification or packing group based on human experience rather than the strict application of classification criteria set out in ADN.
- 280 This entry applies to articles which are used as life-saving vehicle air bag inflators, or air bag modules or seat-belt pretensioners and which contain dangerous goods of Class 1 or dangerous goods of other classes and when carried as component parts and when these articles as presented for carriage have been tested in accordance with Test series 6 (c) of Part I of the *Manual of Tests and Criteria*, with no explosion of the device, no fragmentation of device casing or pressure vessel, and no projection hazard nor thermal effect which

would significantly hinder fire-fighting or other emergency response efforts in the immediate vicinity.

- 283 Articles, containing gas, intended to function as shock absorbers, including impact energy-absorbing devices, or pneumatic springs are not subject to the requirements of ADN provided:
- (a) Each article has a gas space capacity not exceeding 1.6 litres and a charge pressure not exceeding 280 bar where the product of the capacity (litres) and charge pressure (bars) does not exceed 80 (i.e. 0.5 litres gas space and 160 bar charge pressure, 1 litre gas space and 80 bar charge pressure, 1.6 litres gas space and 50 bar charge pressure, 0.28 litres gas space and 280 bar charge pressure);
 - (b) Each article has a minimum burst pressure of 4 times the charge pressure at 20 °C for products not exceeding 0.5 litres gas space capacity and 5 times charge pressure for products greater than 0.5 litres gas space capacity;
 - (c) Each article is manufactured from material which will not fragment upon rupture;
 - (d) Each article is manufactured in accordance with a quality assurance standard acceptable to the competent authority; and
 - (e) The design type has been subjected to a fire test demonstrating that the article relieves its pressure by means of a fire degradable seal or other pressure relief device, such that the article will not fragment and that the article does not rocket.
- See also 1.1.3.2 (d) of ADR for equipment used for the operation of the vehicle.
- 284 An oxygen generator, chemical, containing oxidizing substances shall meet the following conditions:
- (a) The generator when containing an explosive actuating device shall only be carried under this entry when excluded from Class 1 in accordance with the NOTE under paragraph 2.2.1.1.1 (b);
 - (b) The generator, without its packaging, shall be capable of withstanding a 1.8 m drop test onto a rigid, non-resilient, flat and horizontal surface, in the position most likely to cause damage, without loss of its contents and without actuation;
 - (c) When a generator is equipped with an actuating device, it shall have at least two positive means of preventing unintentional actuation.
- 286 Nitrocellulose membrane filters covered by this entry, each with a mass not exceeding 0.5 g, are not subject to the requirements of ADN when contained individually in an article or a sealed packet.

- 288 These substances shall not be classified and carried unless authorized by the competent authority on the basis of results from Series 2 tests and a Series 6 (c) test of Part I of the *Manual of tests and Criteria* on packages as prepared for carriage (see 2.2.1.1).
- 289 Air bag inflators, air bag modules or seat-belt pretensioners installed in conveyances or in completed conveyance components such as steering columns, door panels, seats, etc. are not subject to the requirements of ADN.
- 290 When this material meets the definitions and criteria of other classes as defined in Part 2, it shall be classified in accordance with the predominant subsidiary risk. Such material shall be declared under the proper shipping name and UN number appropriate for the material in that predominant Class, with the addition of the name applicable to this material according to Column (2) of Table A of Chapter 3.2, and shall be carried in accordance with the provisions applicable to that UN number. In addition, all other requirements specified in 1.7.1.5 shall apply, except 5.2.1.7.2.
- 291 Flammable liquefied gases shall be contained within refrigerating machine components. These components shall be designed and tested to at least three times the working pressure of the machinery. The refrigerating machines shall be designed and constructed to contain the liquefied gas and preclude the risk of bursting or cracking of the pressure retaining components during normal conditions of carriage. Refrigerating machines and refrigerating-machine components are not subject to the requirements of ADN if they contain less than 12 kg of gas.
- 292 Mixtures containing not more than 23.5% oxygen by volume may be carried under this entry when no other oxidizing gases are present. A label conforming to model 5.1 is not required for any concentrations within this limit.
- 293 The following definitions apply to matches:
- (a) Fusee matches are matches the heads of which are prepared with a friction-sensitive igniter composition and a pyrotechnic composition which burns with little or no flame, but with intense heat;
 - (b) Safety matches are matches which are combined with or attached to the box, book or card that can be ignited by friction only on a prepared surface;
 - (c) Strike anywhere matches are matches that can be ignited by friction on a solid surface;
 - (d) Wax Vesta matches are matches that can be ignited by friction either on a prepared surface or on a solid surface.
- 295 Batteries need not be individually marked and labelled if the pallet bears the appropriate mark and label.

296 These entries apply for life-saving appliances such as life rafts, personal flotation devices and self-inflating slides. UN No. 2990 applies to self-inflating appliances and UN No. 3072 applies to life-saving appliances that are not self-inflating. Life-saving appliances may contain:

- (a) Signal devices (Class 1) which may include smoke and illumination signal flares packed in packagings that prevent them from being inadvertently activated;
 - (b) For UN No. 2990 only, cartridges, power device of Division 1.4, compatibility group S, may be contained for purposes of the self-inflating mechanism and provided that the quantity of explosives per appliance does not exceed 3.2 g;
 - (c) Class 2 compressed gases, group A or O, according to 2.2.2.1.3;
 - (d) Electric storage batteries (Class 8) and lithium batteries (Class 9);
 - (e) First aid kits or repair kits containing small quantities of dangerous goods (e.g.: substances of Class 3, 4.1, 5.2, 8 or 9); or
 - (f) "Strike anywhere" matches packed in packagings that prevent them from being inadvertently activated.
- 300 Fish meal or fish scrap shall not be loaded if the temperature at the time of loading exceeds 35 °C or 5 °C above the ambient temperature whichever is higher.
- 302 In the proper shipping name, the word "UNIT" means: a vehicle, a wagon, a container or a tank.
- Fumigated vehicles, wagons, containers and tanks are only subject to the provisions of 5.5.2.
- 303 Receptacles shall be assigned to the classification code of the gas or mixture of gases contained therein determined in accordance with the provisions of section 2.2.2.
- 304 Batteries, dry, containing corrosive electrolyte which will not flow out of the battery if the battery case is cracked are not subject to the requirements of ADN provided the batteries are securely packed and protected against short-circuits. Examples of such batteries are: alkali-manganese, zinc-carbon, nickel-metal hydride and nickel-cadmium batteries.
- 305 These substances are not subject to the requirements of ADN when in concentrations of not more than 50 mg/kg.
- 306 This entry may only be used for substances that do not exhibit explosive properties of Class 1 when tested in accordance to Test Series 1 and 2 of Class 1 (see *Manual of Tests and Criteria*, Part I).

307 This entry may only be used for uniform mixtures containing ammonium nitrate as the main ingredient within the following composition limits:

- (a) Not less than 90% ammonium nitrate with not more than 0.2% total combustible/organic material calculated as carbon and with added matter, if any, which is inorganic and inert towards ammonium nitrate; or
- (b) Less than 90% but more than 70% ammonium nitrate with other inorganic materials or more than 80% but less than 90% ammonium nitrate mixed with calcium carbonate and/or dolomite and/or mineral calcium sulphate and not more than 0.4% total combustible/organic material calculated as carbon; or
- (c) Nitrogen type ammonium nitrate based fertilizers containing mixtures of ammonium nitrate and ammonium sulphate with more than 45% but less than 70% ammonium nitrate and not more than 0.4% total combustible/organic material calculated as carbon such that the sum of the percentage compositions of ammonium nitrate and ammonium sulphate exceeds 70%.

309 This entry applies to non sensitized emulsions, suspensions and gels consisting primarily of a mixture of ammonium nitrate and fuel, intended to produce a Type E blasting explosive only after further processing prior to use.

The mixture for emulsions typically has the following composition: 60-85% ammonium nitrate, 5-30% water, 2-8% fuel, 0.5-4% emulsifier agent, 0-10% soluble flame suppressants, and trace additives. Other inorganic nitrate salts may replace part of the ammonium nitrate.

The mixture for suspensions and gels typically has the following composition: 60-85% ammonium nitrate, 0-5% sodium or potassium perchlorate, 0-17% hexamine nitrate or monomethylamine nitrate, 5-30% water, 2-15% fuel, 0.5-4% thickening agent, 0-10% soluble flame suppressants, and trace additives. Other inorganic nitrate salts may replace part of the ammonium nitrate.

Substances shall satisfactorily pass Test Series 8 of the Manual of Tests and Criteria, Part I, Section 18 and be approved by the competent authority.

310 The testing requirements in sub-section 38.3 of the *Manual of Tests and Criteria* do not apply to production runs consisting of not more than 100 cells and batteries, or to pre-production prototypes of cells and batteries when these prototypes are carried for testing, if:

- (a) the cells and batteries are carried in an outer packaging that is a metal, plastics or plywood drum or a metal, plastics or wooden box and that meets the criteria for packing group I; and

- (b) each cell and battery is individually packed in an inner packaging inside an outer packaging and is surrounded by cushioning material that is non-combustible, and non-conductive.
- 311 Substances shall not be carried under this entry unless approved by the competent authority on the basis of the results of appropriate tests according to Part I of the *Manual of Tests and Criteria*. Packaging shall ensure that the percentage of diluent does not fall below that stated in the competent authority approval, at any time during carriage.
- 312 *(Reserved)*
- 313 Substances and mixtures meeting the criteria for Class 8 shall bear a subsidiary risk label conforming to model No. 8 (see 5.2.2.2.2).
- 314 (a) These substances are liable to exothermic decomposition at elevated temperatures. Decomposition can be initiated by heat or by impurities (e.g. powdered metals (iron, manganese, cobalt, magnesium) and their compounds);
- (b) During the course of carriage, these substances shall be shaded from direct sunlight and all sources of heat and be placed in adequately ventilated areas.
- 315 This entry shall not be used for Class 6.1 substances which meet the inhalation toxicity criteria for packing group I described in 2.2.61.1.8.
- 316 This entry applies only to calcium hypochlorite, dry, when carried in non friable tablet form.
- 317 "Fissile-excepted" applies only to those packages complying with 6.4.11.2 of ADR.
- 318 For the purposes of documentation, the proper shipping name shall be supplemented with the technical name (see 3.1.2.8). When the infectious substances to be carried are unknown, but suspected of meeting the criteria for inclusion in category A and assignment to UN No. 2814 or 2900, the words "suspected category A infectious substance" shall be shown, in parentheses, following the proper shipping name on the transport document.
- 319 Substances packed and packages marked in accordance with packing instruction P650 of ADR are not subject to any other requirements of ADN.
- 321 These storage systems shall always be considered as containing hydrogen.
- 322 When carried in non-friable tablet form, these goods are assigned to packing group III.
- 323 *(Reserved)*

- 324 This substance needs to be stabilized when in concentrations of not more than 99%.
- 325 In the case of non-fissile or fissile excepted uranium hexafluoride, the material shall be classified under UN No 2978.
- 326 In the case of fissile uranium hexafluoride, the material shall be classified under UN No 2977.
- 327 Waste aerosols consigned in accordance with 5.4.1.1.3 may be carried under this entry for the purposes of reprocessing or disposal. They need not be protected against inadvertent discharge provided that measures to prevent dangerous build up of pressure and dangerous atmospheres are addressed. Waste aerosols, other than those leaking or severely deformed, shall be packed in accordance with packing instruction P003 of ADR and special provision PP87 of ADR, or packing instruction LP02 of ADR and special packing provision L2 of ADR. Leaking or severely deformed aerosols shall be carried in salvage packagings provided appropriate measures are taken to ensure there is no dangerous build up of pressure.

NOTE: For maritime carriage, waste aerosols shall not be carried in closed containers.

- 328 This entry applies to fuel cell cartridges including when contained in equipment or packed with equipment. Fuel cell cartridges installed in or integral to a fuel cell system are regarded as contained in equipment. Fuel cell cartridge means an article that stores fuel for discharge into the fuel cell through (a) valve(s) that control(s) the discharge of fuel into the fuel cell. Fuel cell cartridges, including when contained in equipment, shall be designed and constructed to prevent fuel leakage under normal conditions of carriage.

Fuel cell cartridge design types using liquids as fuels shall pass an internal pressure test at a pressure of 100 kPa (gauge) without leakage.

Except for fuel cell cartridges containing hydrogen in metal hydride which shall be in compliance with special provision 339, each fuel cell cartridge design type shall be shown to pass a 1.2 meter drop test onto an unyielding surface in the orientation most likely to result in failure of the containment system with no loss of contents.

- 329 *(Reserved)*
- 331 *(Reserved)*
- 332 Magnesium nitrate hexahydrate is not subject to the requirements of ADN.
- 333 Ethanol and gasoline, motor spirit or petrol mixtures for use in spark-ignition engines (e.g. in automobiles, stationary engines and other engines) shall be assigned to this entry regardless of variations in volatility.

- 334 A fuel cell cartridge may contain an activator provided it is fitted with two independent means of preventing unintended mixing with the fuel during carriage.
- 335 Mixtures of solids which are not subject to the requirements of ADN and environmentally hazardous liquids or solids shall be classified as UN 3077 and may be carried under this entry provided there is no free liquid visible at the time the substance is loaded or at the time the packaging or vehicle, wagon or container is closed. Each vehicle or container shall be leakproof when used for carriage in bulk. If free liquid is visible at the time the mixture is loaded or at the time the packaging or vehicle, wagon or container is closed, the mixture shall be classified as UN 3082. Sealed packets and articles containing less than 10 ml of an environmentally hazardous liquid, absorbed into a solid material but with no free liquid in the packet or article, or containing less than 10 g of an environmentally hazardous solid, are not subject to the requirements of ADN.
- 336 A single package of non-combustible solid LSA-II or LSA-III material, if carried by air, shall not contain an activity greater than 3 000 A₂.
- 337 Type B(U) and Type B(M) packages, if carried by air, shall not contain activities greater than the following:
- (a) For low dispersible radioactive material: as authorized for the package design as specified in the certificate of approval;
 - (b) For special form radioactive material: 3 000 A₁ or 100 000 A₂, whichever is the lower; or
 - (c) For all other radioactive material: 3 000 A₂.
- 338 Each fuel cell cartridge carried under this entry and designed to contain a liquefied flammable gas shall:
- (a) Be capable of withstanding, without leakage or bursting, a pressure of at least two times the equilibrium pressure of the contents at 55 °C;
 - (b) Not contain more than 200 ml of liquefied flammable gas with a vapour pressure not exceeding 1 000 kPa at 55 °C; and
 - (c) Pass the hot water bath test prescribed in 6.2.6.3.1 of ADR.
- 339 Fuel cell cartridges containing hydrogen in a metal hydride carried under this entry shall have a water capacity less than or equal to 120 ml.

The pressure in the fuel cell cartridge shall not exceed 5 MPa at 55 °C. The design type shall withstand, without leaking or bursting, a pressure of twice the design pressure of the cartridge at 55 °C or 200 kPa more than the design pressure of the cartridge at 55 °C, whichever is greater. The pressure at which this test is conducted is referred to in the drop test and the hydrogen cycling test as the “minimum shell burst pressure”.

Fuel cell cartridges shall be filled in accordance with procedures provided by the manufacturer. The manufacturer shall provide the following information with each fuel cell cartridge:

- (a) Inspection procedures to be carried out before initial filling and before refilling of the fuel cell cartridge;
- (b) Safety precautions and potential hazards to be aware of;
- (c) Method for determining when the rated capacity has been achieved;
- (d) Minimum and maximum pressure range;
- (e) Minimum and maximum temperature range; and
- (f) Any other requirements to be met for initial filling and refilling including the type of equipment to be used for initial filling and refilling.

The fuel cell cartridges shall be designed and constructed to prevent fuel leakage under normal conditions of carriage. Each cartridge design type, including cartridges integral to a fuel cell, shall be subjected to and shall pass the following tests:

Drop test

A 1.8 metre drop test onto an unyielding surface in four different orientations:

- (a) Vertically, on the end containing the shut-off valve assembly;
- (b) Vertically, on the end opposite to the shut-off valve assembly;
- (c) Horizontally, onto a steel apex with a diameter of 38 mm, with the steel apex in the upward position; and
- (d) At a 45° angle on the end containing the shut-off valve assembly.

There shall be no leakage, determined by using a soap bubble solution or other equivalent means on all possible leak locations, when the cartridge is charged to its rated charging pressure. The fuel cell cartridge shall then be hydrostatically pressurized to destruction. The recorded burst pressure shall exceed 85% of the minimum shell burst pressure.

Fire test

A fuel cell cartridge filled to rated capacity with hydrogen shall be subjected to a fire engulfment test. The cartridge design, which may include a vent feature integral to it, is deemed to have passed the fire test if :

- (a) The internal pressure vents to zero gauge pressure without rupture of the cartridge; or
- (b) The cartridge withstands the fire for a minimum of 20 minutes without rupture.

Hydrogen cycling test

This test is intended to ensure that a fuel cell cartridge design stress limits are not exceeded during use.

The fuel cell cartridge shall be cycled from not more than 5% rated hydrogen capacity to not less than 95% rated hydrogen capacity and back to not more than 5% rated hydrogen capacity. The rated charging pressure shall be used for charging and temperatures shall be held within the operating temperature range. The cycling shall be continued for at least 100 cycles.

Following the cycling test, the fuel cell cartridge shall be charged and the water volume displaced by the cartridge shall be measured. The cartridge design is deemed to have passed the hydrogen cycling test if the water volume displaced by the cycled cartridge does not exceed the water volume displaced by an uncycled cartridge charged to 95% rated capacity and pressurized to 75% of its minimum shell burst pressure.

Production leak test

Each fuel cell cartridge shall be tested for leaks at $15\text{ °C} \pm 5\text{ °C}$, while pressurized to its rated charging pressure. There shall be no leakage, determined by using a soap bubble solution or other equivalent means on all possible leak locations.

Each fuel cell cartridge shall be permanently marked with the following information:

- (a) The rated charging pressure in MPa;
- (b) The manufacturer's serial number of the fuel cell cartridges or unique identification number; and
- (c) The date of expiry based on the maximum service life (year in four digits; month in two digits).

340 Chemical kits, first aid kits and polyester resin kits containing dangerous substances in inner packagings which do not exceed the quantity limits for excepted quantities applicable to individual substances as specified in column 7b of Table A of Chapter 3.2, may be carried in accordance with Chapter 3.5. Class 5.2 substances, although not individually authorized as excepted quantities in column 7b of Table A of Chapter 3.2, are authorized in such kits and are assigned Code E2 (see 3.5.1.2).

341-499 (*Reserved*)

500 UN No. 3064 nitroglycerin, solution in alcohol with more than 1% but not more than 5% nitroglycerin, packed in accordance with packing instruction P300 of 4.1.4.1 of ADR, is a substance of Class 3.

501 For naphthalene, molten, see UN No. 2304.

502 UN No. 2006 plastics, nitrocellulose-based, self-heating, n.o.s., and UN No. 2002 celluloid scrap are substances of Class 4.2.

- 503 For phosphorus, white or yellow, molten, see UN No. 2447.
- 504 UN No. 1847 potassium sulphide, hydrated with not less than 30% water of crystallization, UN No. 1849 sodium sulphide, hydrated with not less than 30% water of crystallization and UN No. 2949 sodium hydrosulphide with not less than 25% water of crystallization are substances of Class 8.
- 505 UN No. 2004 magnesium diamide is a substance of Class 4.2.
- 506 Alkaline earth metals and alkaline earth metal alloys in pyrophoric form are substances of Class 4.2.
- UN No. 1869 magnesium or magnesium alloys containing more than 50% magnesium as pellets, turnings or ribbons, are substances of Class 4.1.
- 507 UN No. 3048 aluminium phosphide pesticides, with additives inhibiting the emission of toxic flammable gases are substances of Class 6.1.
- 508 UN No. 1871 titanium hydride and UN No. 1437 zirconium hydride are substances of Class 4.1. UN No. 2870 aluminium borohydride is a substance of Class 4.2.
- 509 UN No. 1908 chlorite solution is a substance of Class 8.
- 510 UN No. 1755 chromic acid solution is a substance of Class 8.
- 511 UN No. 1625 mercuric nitrate, UN No. 1627 mercurous nitrate and UN No. 2727 thallium nitrate are substances of Class 6.1. Thorium nitrate, solid, uranyl nitrate hexahydrate solution and uranyl nitrate, solid are substances of Class 7.
- 512 UN No. 1730 antimony pentachloride, liquid, UN No. 1731 antimony pentachloride solution, UN No. 1732 antimony pentafluoride and UN No. 1733 antimony trichloride are substances of Class 8.
- 513 UN No. 0224 barium azide, dry or wetted with less than 50% water, by mass, is a substance of Class 1. UN No. 1571 barium azide, wetted with not less than 50% water, by mass, is a substance of Class 4.1. UN No. 1854 barium alloys, pyrophoric, are substances of Class 4.2. UN No. 1445 barium chlorate, solid, UN No. 1446 barium nitrate, UN No. 1447 barium perchlorate, solid, UN No. 1448 barium permanganate, UN No. 1449 barium peroxide, UN No. 2719 barium bromate, UN No. 2741 barium hypochlorite with more than 22% available chlorine, UN No. 3405 barium chlorate, solution and UN No. 3406 barium perchlorate, solution, are substances of Class 5.1. UN No. 1565 barium cyanide and UN No. 1884 barium oxide are substances of Class 6.1.
- 514 UN No. 2464 beryllium nitrate is a substance of Class 5.1.
- 515 UN No. 1581 chloropicrin and methyl bromide mixture and UN No. 1582 chloropicrin and methyl chloride mixture are substances of Class 2.

- 516 UN No. 1912 methyl chloride and methylene chloride mixture is a substance of Class 2.
- 517 UN No. 1690 sodium fluoride, solid, UN No. 1812 potassium fluoride, solid, UN No. 2505 ammonium fluoride, UN No. 2674 sodium fluorosilicate, UN No. 2856 fluorosilicates, n.o.s., UN No. 3415 sodium fluoride, solution and UN No. 3422 potassium fluoride, solution, are substances of Class 6.1.
- 518 UN No. 1463 chromium trioxide, anhydrous (chromic acid, solid) is a substance of Class 5.1.
- 519 UN No. 1048 hydrogen bromide, anhydrous, is a substance of Class 2.
- 520 UN No. 1050 hydrogen chloride, anhydrous, is a substance of Class 2.
- 521 Solid chlorites and hypochlorites are substances of Class 5.1.
- 522 UN No. 1873 perchloric acid aqueous solution with more than 50% but not more than 72% pure acid, by mass are substances of Class 5.1. Perchloric acid solutions containing more than 72% pure acid, by mass, or mixtures of perchloric acid with any liquid other than water, are not to be accepted for carriage.
- 523 UN No. 1382 anhydrous potassium sulphide and UN No. 1385 anhydrous sodium sulphide and their hydrates with less than 30% water of crystallization, and UN No. 2318 sodium hydrosulphide with less than 25% water of crystallization are substances of Class 4.2.
- 524 UN No. 2858 finished zirconium products of a thickness of 18 µm or more are substances of Class 4.1.
- 525 Solutions of inorganic cyanides with a total cyanide ion content of more than 30% shall be classified in packing group I, solutions with a total cyanide ion content of more than 3% and not more than 30% in packing group II and solutions with a cyanide ion content of more than 0.3% and not more than 3% in packing group III.
- 526 UN No. 2000 celluloid is assigned to Class 4.1.
- 527 *(Reserved)*
- 528 UN No. 1353 fibres or fabrics impregnated with weakly nitrated cellulose, non-self heating are articles of Class 4.1.
- 529 UN No. 0135 mercury fulminate, wetted with not less than 20% water, or mixture of alcohol and water, by mass, is a substance of Class 1. Mercurous chloride (calomel) is a substance of Class 9 (UN No. 3077).
- 530 UN No. 3293 hydrazine, aqueous solution with not more than 37% hydrazine, by mass, is a substance of Class 6.1.

- 531 Mixtures having a flash-point below 23 °C and containing more than 55% nitrocellulose, whatever its nitrogen content or containing not more than 55% nitrocellulose with a nitrogen content above 12.6% (by dry mass), are substances of Class 1 (see UN Nos. 0340 or 0342) or of Class 4.1.
- 532 UN No. 2672 ammonia solution containing not less than 10% but not more than 35% ammonia is a substance of Class 8.
- 533 UN No. 1198 formaldehyde solutions, flammable are substances of Class 3. Formaldehyde solutions, non-flammable, with less than 25% formaldehyde are not subject to the requirements of ADN.
- 534 While in some climatic conditions, petrol (gasoline) may have a vapour pressure at 50 °C of more than 110 kPa (1.10 bar) but not more than 150 kPa (1.50 bar) it is to continue to be considered as a substance having a vapour pressure at 50 °C of not more than 110 kPa (1.10 bar).
- 535 UN No. 1469 lead nitrate, UN No. 1470 lead perchlorate, solid and UN No. 3408 lead perchlorate, solution are substances of Class 5.1.
- 536 For naphthalene, solid, see UN No. 1334.
- 537 UN No. 2869 titanium trichloride mixture, not pyrophoric, is a substance of Class 8.
- 538 For sulphur (in the solid state), see UN No. 1350.
- 539 Solutions of isocyanates having a flash-point of not less than 23 °C are substances of Class 6.1.
- 540 UN No. 1326 hafnium powder, wetted, UN No. 1352 titanium powder, wetted or UN No. 1358 zirconium powder, wetted, with not less than 25% water, are substances of Class 4.1.
- 541 Nitrocellulose mixtures with a water content, alcohol content or plasticizer content lower than the stated limits are substances of Class 1.
- 542 Talc containing tremolite and/or actinolite is covered by this entry.
- 543 UN No. 1005 ammonia, anhydrous, UN No. 3318 ammonia solution with more than 50% ammonia and UN No. 2073 ammonia solution, with more than 35% but not more than 50% ammonia, are substances of Class 2. Ammonia solutions with not more than 10% ammonia are not subject to the requirements of ADN.
- 544 UN No. 1032 dimethylamine, anhydrous, UN No. 1036 ethylamine, UN No. 1061 methylamine, anhydrous and UN No. 1083 trimethylamine, anhydrous, are substances of Class 2.

- 545 UN No. 0401 dipicryl sulphide, wetted with less than 10% water by mass is a substance of Class 1.
- 546 UN No. 2009 zirconium, dry, finished sheets, strip or coiled wire, in thicknesses of less than 18 μm , is a substance of Class 4.2. Zirconium, dry, finished sheets, strip or coiled wire, in thicknesses of 254 μm or more, is not subject to the requirements of ADN.
- 547 UN No. 2210 maneb or UN No. 2210 maneb preparations in self-heating form are substances of Class 4.2.
- 548 Chlorosilanes which, in contact with water, emit flammable gases, are substances of Class 4.3.
- 549 Chlorosilanes having a flash-point of less than 23 °C and which, in contact with water, do not emit flammable gases are substances of Class 3. Chlorosilanes having a flash-point equal to or greater than 23 °C and which, in contact with water, do not emit flammable gases are substances of Class 8.
- 550 UN No. 1333 cerium in slabs, rods or ingots is a substance of Class 4.1.
- 551 Solutions of these isocyanates having a flash-point below 23 °C are substances of Class 3.
- 552 Metals and metal alloys in powdered or other flammable form, liable to spontaneous combustion, are substances of Class 4.2. Metals and metal alloys in powdered or other flammable form which, in contact with water, emit flammable gases are substances of Class 4.3.
- 553 This mixture of hydrogen peroxide and peroxyacetic acid shall, in laboratory testing (see *Manual of Tests and Criteria*, Part II, section 20), neither detonate in the cavitated state nor deflagrate at all and shall show no effect when heated under confinement nor any explosive power. The formulation shall be thermally stable (self-accelerating decomposition temperature 60 °C or higher for a 50 kg package), and a liquid compatible with peroxyacetic acid shall be used for desensitization. Formulations not meeting these criteria are to be regarded as substances of Class 5.2 (see *Manual of Tests and Criteria*, Part II, paragraph 20.4.3 (g)).
- 554 Metal hydrides which, in contact with water, emit flammable gases are substances of Class 4.3. UN No. 2870 aluminium borohydride or UN No. 2870 aluminium borohydride in devices is a substance of Class 4.2.
- 555 Dust and powder of metals in non-spontaneously combustible form, non-toxic which nevertheless, in contact with water, emit flammable gases, are substances of Class 4.3.

- 556 Organometallic compounds and their solutions which ignite spontaneously are substances of Class 4.2. Flammable solutions with organometallic compounds in concentrations which, in contact with water, neither emit flammable gases in dangerous quantities nor ignite spontaneously are substances of Class 3.
- 557 Dust and powder of metals in pyrophoric form are substances of Class 4.2.
- 558 Metals and metal alloys in pyrophoric form are substances of Class 4.2. Metals and metal alloys which, in contact with water, do not emit flammable gases and are not pyrophoric or self-heating, but which are easily ignited, are substances of Class 4.1.
- 559 Mixtures of a hypochlorite with an ammonium salt are not to be accepted for carriage. UN No. 1791 hypochlorite solution is a substance of Class 8.
- 560 UN No. 3257 elevated temperature liquid, n.o.s., at or above 100 °C and, for a substance with a flash-point, below its flash-point (including molten metals and molten salts) is a substance of Class 9.
- 561 Chloroformates having predominantly corrosive properties are substances of Class 8.
- 562 Spontaneously combustible organometallic compounds are substances of Class 4.2. Water-reactive organometallic compounds, flammable, are substances of Class 4.3.
- 563 UN No. 1905 selenic acid is a substance of Class 8.
- 564 UN No. 2443 vanadium oxytrichloride, UN No. 2444 vanadium tetrachloride and UN No. 2475 vanadium trichloride are substances of Class 8.
- 565 Unspecified wastes resulting from medical/veterinary treatment of humans/animals or from biological research, and which are unlikely to contain substances of Class 6.2 shall be assigned to this entry. Decontaminated clinical wastes or wastes resulting from biological research which previously contained infectious substances are not subject to the requirements of Class 6.2.
- 566 UN No. 2030 hydrazine aqueous solution, with more than 37% hydrazine, by mass, is a substance of Class 8.
- 567 Mixtures containing more than 21% oxygen by volume shall be classified as oxidizing.
- 568 Barium azide with a water content lower than the stated limit is a substance of Class 1, UN No. 0224.
- 569-579 (Reserved)

580 Tank-vehicles, tank-wagons, specialized vehicles, specialized wagons and specially equipped vehicles and wagons for carriage in bulk shall bear on both sides and at the rear the mark referred to in 5.3.3. Tank-containers, portable tanks, special containers and specially equipped containers for carriage in bulk shall bear this mark on both sides and at each end.

581 This entry covers mixtures of methylacetylene and propadiene with hydrocarbons, which as:

Mixture P1, contain not more than 63% methylacetylene and propadiene by volume and not more than 24% propane and propylene by volume, the percentage of C₄-saturated hydrocarbons being not less than 14% by volume; and as

Mixture P2, contain not more than 48% methylacetylene and propadiene by volume and not more than 50% propane and propylene by volume, the percentage of C₄-saturated hydrocarbons being not less than 5% by volume,

as well as mixtures of propadiene with 1 to 4% methylacetylene.

When relevant, in order to meet the requirements for the transport document (5.4.1.1), the term "Mixture P1" or "Mixture P2" may be used as technical name.

582 This entry covers, inter alia, mixtures of gases indicated by the letter R ..., which as

Mixture F1, have a vapour pressure at 70 °C not exceeding 1.3 MPa (13 bar) and a density at 50 °C not lower than that of dichlorofluoromethane (1.30 kg/l);

Mixture F2, have a vapour pressure at 70 °C not exceeding 1.9 MPa (19 bar) and a density at 50 °C not lower than that of dichloridifluoromethane (1.21 kg/l);

Mixture F3, have a vapour pressure at 70 °C not exceeding 3 MPa (30 bar) and a density at 50 °C not lower than that of chlorodifluoromethane (1.09 kg/l).

NOTE: *Trichlorofluoromethane (refrigerant R 11), 1,1,2-trichloro-1,2,2-trifluoroethane (refrigerant R 113), 1,1,1-trichloro-2,2,2-trifluoroethane (refrigerant R 113a), 1-chloro-1,2,2-trifluoroethane (refrigerant R 133) and 1-chloro-1,1,2-trifluoroethane (refrigerant R 133 b) are not substances of Class 2. They may, however, enter into the composition of mixtures F1 to F3.*

When relevant, in order to meet the requirements for the transport document (5.4.1.1), the term "Mixture F1", "Mixture F2" or "Mixture F3" may be used as technical name.

583 This entry covers, inter alia, mixtures which as:

Mixture A, have a vapour pressure at 70 °C not exceeding 1.1 MPa (11 bar) and a density at 50 °C not lower than 0.525 kg/l;

Mixture A01, have a vapour pressure at 70 °C not exceeding 1.6 MPa (16 bar) and a density at 50 °C not lower than 0.516 kg/l;

Mixture A02, have a vapour pressure at 70 °C not exceeding 1.6 MPa (16 bar) and a density at 50 °C not lower than 0.505 kg/l;

Mixture A0, have a vapour pressure at 70 °C not exceeding 1.6 MPa (16 bar) and a density at 50 °C not lower than 0.495 kg/l;

Mixture A1, have a vapour pressure at 70 °C not exceeding 2.1 MPa (21 bar) and a density at 50 °C not lower than 0.485 kg/l;

Mixture B1, have a vapour pressure at 70 °C not exceeding 2.6 MPa (26 bar) and a density at 50 °C not lower than 0.474 kg/l;

Mixture B2, have a vapour pressure at 70 °C not exceeding 2.6 MPa (26 bar) and a density at 50 °C not lower than 0.463 kg/l;

Mixture B, have a vapour pressure at 70 °C not exceeding 2.6 MPa (26 bar) and a density at 50 °C not lower than 0.450 kg/l;

Mixture C, have a vapour pressure at 70 °C not exceeding 3.1 MPa (31 bar) and a density at 50 °C not lower than 0.440 kg/l;

When relevant, in order to meet the requirements for the transport document (5.4.1.1), the following terms may be used as technical name:

- "Mixture A" or "Butane";
- "Mixture A01" or "Butane";
- "Mixture A02" or "Butane";
- "Mixture A0" or "Butane";
- "Mixture A1";
- "Mixture B1";
- "Mixture B2";
- "Mixture B";
- "Mixture C" or "Propane".

For carriage in tanks, the trade names "butane" or "propane" may be used only as a complement.

584 This gas is not subject to the requirements of ADN when:

- it is in the gaseous state;
 - it contains not more than 0.5% air;
 - it is contained in metal capsules (sodors, sparklets) free from defects which may impair their strength;
 - the leakproofness of the closure of the capsule is ensured;
 - a capsule contains not more than 25 g of this gas;
 - a capsule contains not more than 0.75 g of this gas per cm³ of capacity.
- 585 Cinnabar is not subject to the requirements of ADN.
- 586 Hafnium, titanium and zirconium powders shall contain a visible excess of water. Hafnium, titanium and zirconium powders, wetted, mechanically produced, of a particle size of 53 µm and over, or chemically produced, of a particle size of 840 µm and over, are not subject to the requirements of ADN.
- 587 Barium stearate and barium titanate are not subject to the requirements of ADN.
- 588 Solid hydrated forms of aluminium bromide and aluminium chloride are not subject to the requirements of ADN.
- 589 Calcium hypochlorite mixtures, dry, containing not more than 10% available chlorine are not subject to the requirements of ADN.
- 590 Ferric chloride hexahydrate is not subject to the requirements of ADN.
- 591 Lead sulphate with not more than 3% free acid is not subject to the requirements of ADN.
- 592 Uncleaned empty packagings (including empty IBCs and large packagings), empty tank-vehicles, empty demountable tanks, empty portable tanks, empty tank-containers and empty small containers which have contained this substance are not subject to the requirements of ADN.
- 593 This gas, intended for the cooling of e.g. medical or biological specimens, if contained in double wall receptacles which comply with the provisions of packing instruction P203 (12) of 4.1.4.1 of ADR is not subject to the requirements of ADN.
- 594 The following articles, manufactured and filled according to the regulations of the manufacturing State and packaged in strong outer packagings, are not subject to the requirements of ADN:
- UN No. 1044 fire extinguishers provided with protection against inadvertent discharge;

- UN No. 3164 articles, pressurized pneumatic or hydraulic, designed to withstand stresses greater than the internal gas pressure by virtue of transmission of force, intrinsic strength or construction.
- 596 Cadmium pigments, such as cadmium sulphides, cadmium sulphoselenides and cadmium salts of higher fatty acids (e.g. cadmium stearate), are not subject to the requirements of ADN.
- 597 Acetic acid solutions with not more than 10% pure acid by mass, are not subject to the requirements of ADN.
- 598 The following are not subject to the requirements of ADN:
- (a) New storage batteries when:
 - they are secured in such a way that they cannot slip, fall or be damaged;
 - they are provided with carrying devices, unless they are suitably stacked, e.g. on pallets;
 - there are no dangerous traces of alkalis or acids on the outside;
 - they are protected against short circuits;
 - (b) Used storage batteries when:
 - their cases are undamaged;
 - they are secured in such a way that they cannot leak, slip, fall or be damaged, e.g. by stacking on pallets;
 - there are no dangerous traces of alkalis or acids on the outside of the articles;
 - they are protected against short circuits.
- "Used storage batteries" means storage batteries carried for recycling at the end of their normal service life.
- 599 Manufactured articles or instruments containing not more than 1 kg of mercury are not subject to the requirements of ADN.
- 600 Vanadium pentoxide, fused and solidified, is not subject to the requirements of ADN.
- 601 Pharmaceutical products (medicines) ready for use, which are substances manufactured and packaged for retail sale or distribution for personal or household consumption are not subject to the requirements of ADN.

- 602 Phosphorus sulphides which are not free from yellow and white phosphorus are not to be accepted for carriage.
- 603 Anhydrous hydrogen cyanide not meeting the description for UN No. 1051 or UN No. 1614 is not to be accepted for carriage. Hydrogen cyanide (hydrocyanic acid) containing less than 3% water is stable, if the pH-value is 2.5 ± 0.5 and the liquid is clear and colourless.
- 604 Ammonium bromate and its aqueous solutions and mixtures of a bromate with an ammonium salt are not to be accepted for carriage.
- 605 Ammonium chlorate and its aqueous solutions and mixtures of a chlorate with an ammonium salt are not to be accepted for carriage.
- 606 Ammonium chlorite and its aqueous solutions and mixtures of a chlorite with an ammonium salt are not to be accepted for carriage.
- 607 Mixtures of potassium nitrate and sodium nitrite with an ammonium salt are not to be accepted for carriage.
- 608 Ammonium permanganate and its aqueous solutions and mixtures of a permanganate with an ammonium salt are not to be accepted for carriage.
- 609 Tetranitromethane not free from combustible impurities is not to be accepted for carriage.
- 610 The carriage of this substance, when it contains more than 45% hydrogen cyanide is prohibited.
- 611 Ammonium nitrate containing more than 0.2% combustible substances (including any organic substance calculated as carbon) is not to be accepted for carriage unless it is a constituent of a substance or article of Class 1.
- 612 *(Reserved)*
- 613 Chloric acid solution containing more than 10% chloric acid and mixtures of chloric acid with any liquid other than water is not to be accepted for carriage.
- 614 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in concentrations considered highly toxic according to the criteria in 2.2.61.1 is not to be accepted for carriage.
- 615 *(Reserved)*
- 616 Substances containing more than 40% liquid nitric esters shall satisfy the exudation test specified in 2.3.1.
- 617 In addition to the type of explosive, the commercial name of the particular explosive shall be marked on the package.

618 In receptacles containing 1,2-butadiene, the oxygen concentration in the gaseous phase shall not exceed 50 ml/m³.

619-622 (*Reserved*)

623 UN No. 1829 sulphur trioxide shall be inhibited. Sulphur trioxide, 99.95% pure or above, may be carried without inhibitor in tanks provided that its temperature is maintained at or above 32.5 °C. For the carriage of this substance without inhibitor in tanks at a minimum temperature of 32.5 °C, the specification "**Transport under minimum temperature of the product of 32.5 °C**" shall appear in the transport document.

625 Packages containing these articles shall be clearly marked as follows:
"**UN 1950 AEROSOLS**"

626-631 (*Reserved*)

632 Considered to be spontaneously flammable (pyrophoric).

633 Packages and small containers containing this substance shall bear the following marking: "**Keep away from any source of ignition**". This marking shall be in an official language of the forwarding country, and also, if that language is not English, French or German, in English, French or German, unless any agreements concluded between the countries concerned in the transport operation provide otherwise.

635 Packages containing these articles need not bear a label conforming to model No. 9 unless the article is fully enclosed by packaging, crates or other means that prevent the ready identification of the article.

636 (a) Cells contained in equipment shall not be capable of being discharged during carriage to the extent that the open circuit voltage falls below 2 volts or two thirds of the voltage of the undischarged cell, whichever is the lower.

(b) Used lithium cells and batteries with a gross mass of not more than 500 g each collected and presented for carriage for disposal between the consumer collecting point and the intermediate processing facility, together with other non-lithium cells or batteries, are not subject to the other provisions of ADN if they meet the following conditions:

(i) The provisions of packing instruction P903b of ADR are complied with;

(ii) A quality assurance system is in place to ensure that the total amount of lithium cells or batteries in each wagon or large container/transport unit does not exceed 333 kg;

(iii) Packages shall bear the inscription: "**USED LITHIUM CELLS**".

- 637 Genetically modified microorganisms and genetically modified organisms are those which are not dangerous for humans and animals, but which could alter animals, plants, microbiological substances and ecosystems in such a way as cannot occur naturally. Genetically modified microorganisms and genetically modified organisms are not subject to the requirements of ADN when authorized for use by the competent authorities of the countries of origin, transit and destination.⁴

⁴ See in particular Part C of Directive 2001/18/EC of the European Parliament and of the Council on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC (Official Journal of the European Communities, No. L 106, of 17 April 2001, pp. 8-14), which sets out the authorization procedures for the European Community.

Live vertebrate or invertebrate animals shall not be used to carry these substances classified under this UN number unless the substance can be carried in no other way. For the carriage of easily perishable substances under this UN number appropriate information shall be given, e.g.: "**Cool at +2 °/+4 °C**" or "**Carry in frozen state**" or "**Do not freeze**".

638 Substances related to self-reactive substances (see 2.2.41.1.19).

639 See 2.2.2.3, classification code 2F, UN No. 1965, Note 2.

640 The physical and technical characteristics mentioned in column (2) of Table A of Chapter 3.2 determine different tank codes for the carriage of substances of the same packing group in tanks conforming to Chapter 6.8 of RID or ADR.

In order to identify these physical and technical characteristics of the product carried in the tank, the following shall be added, to the particulars required in the transport document, only in case of carriage in tanks conforming to Chapter 6.8 of ADR or RID:

"Special provision 640X" where "X" is the applicable capital letter appearing after the reference to special provision 640 in column (6) of Table A of Chapter 3.2.

These particulars may, however, be dispensed with in the case of carriage in the type of tank which, for substances of a specific packing group of a specific UN number, meets at least the most stringent requirements.

643 Stone or aggregate asphalt mixture is not subject to the requirements for Class 9.

644 This substance is admitted for carriage provided that:

- The pH is between 5 and 7 measured in an aqueous solution of 10% of the substance carried;
- The solution does not contain more than 0.2% combustible material or chlorine compounds in quantities such that the chlorine level exceeds 0.02%.

645 The classification code as mentioned in Column (3b) of Table A of Chapter 3.2 shall be used only with the approval of the competent authority of a Contracting Party to ADN prior to carriage. When assignment to a division is made in accordance with the procedure in 2.2.1.1.7.2, the competent authority may require the default classification to be verified on the basis of test data derived from Test Series 6 of the Manual of Tests and Criteria, Part I, Section 16.

646 Carbon made by steam activation process is not subject to the requirements of ADN.

647 Except for carriage in tank vessels, the carriage of vinegar and acetic acid with not more than 25 % pure acid by mass is subject only to the following requirements:

- (a) Packagings, including IBCs and large packagings, and tanks shall be manufactured from stainless steel or plastic material which is permanently resistant to corrosion of vinegar/acetic acid food grade;
- (b) Packagings, including IBCs and large packagings, and tanks shall be subjected to a visual inspection by the owner at least once a year. The results of the inspections shall be recorded and the records kept for at least one year. Damaged packagings, including IBCs and large packagings, and tanks shall not be filled;
- (c) Packagings, including IBCs and large packagings, and tanks shall be filled in a way that no product is spilled or adheres to the outer surface;
- (d) Seals and closures shall be resistant to vinegar/acetic acid food grade. Packagings, including IBCs and large packagings, and tanks shall be hermetically sealed by the person in charge of packaging and/or filling so that under normal conditions of carriage there will be no leakage;
- (e) Combination packagings with inner packaging made of glass or plastic (see packing instruction P001 in 4.1.4.1 of ADR) which fulfil the general packing requirements of 4.1.1.1, 4.1.1.2, 4.1.1.4, 4.1.1.5, 4.1.1.6, 4.1.1.7 and 4.1.1.8 of ADR may be used;

The other provisions of ADN do not apply except those relating to carriage in tank vessels.

648 Articles impregnated with this pesticide, such as fibreboard plates, paper strips, cotton-wool balls, sheets of plastics material, in hermetically closed wrappings, are not subject to the provisions of ADN.

649 To determine the initial boiling point, as mentioned under 2.2.3.1.3, packing group I, the test method according to standard ASTM D86-01² is suitable.

Substances which have an initial boiling point above 35 °C determined with this method are substances of packing group II and shall be classified in accordance with the applicable entry of this packing group.

650 Waste consisting of packaging residues, solidified residues and liquid residues of paint may be carried under the conditions of packing group II. In addition to the provisions of UN No. 1263, packing group II, the waste may also be packed and carried as follows:

- (a) The waste may be packed in accordance with packing instruction P002 of 4.1.4.1 of ADR or to packing instruction IBC006 of 4.1.4.2 of ADR;

² *Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure, published September 2001 by ASTM International.*

- (b) The waste may be packed in flexible IBCs of types 13H3, 13H4 and 13H5 in overpacks with complete walls;
- (c) Testing of packagings and IBCs indicated under (a) or (b) may be carried out in accordance with the requirements of Chapters 6.1 or 6.5 of ADR, as appropriate, in relation to solids, at the packing group II performance level.
- The tests shall be carried out on packagings and IBCs, filled with a representative sample of the waste, as prepared for carriage;
- (d) Carriage in bulk in sheeted wagons, movable roof wagons/sheeted vehicles, closed containers or sheeted large containers, all with complete walls is allowed. The wagons, containers or body of vehicles shall be leakproof or rendered leakproof, for example by means of a suitable and sufficiently stout inner lining;
- (e) If the waste is carried under the conditions of this special provision, the goods shall be declared in accordance with 5.4.1.1.3 in the transport document, as follows: "WASTE, UN 1263 PAINT, 3, II.
- 651 Special provision V2 (1) of ADR is only applicable for a net explosive content of more than 3,000 kg (4,000 kg with trailer).
- 652 *(Reserved)*
- 653 The carriage of this gas in cylinders with a maximum capacity of 0.5 litres, is not subject to the other provisions of ADN if the following conditions are met:
- The provisions for construction and testing of cylinders are observed;
 - The cylinders are contained in outer packagings which at least meet the requirements of Part 4 for combination packagings. The general provisions of packing of 4.1.1.1, 4.1.1.2 and 4.1.1.5 to 4.1.1.7 of ADR shall be observed;
 - The cylinders are not packed together with other dangerous goods;
 - The total gross mass of a package does not exceed 30 kg; and
 - Each package is clearly and durably marked with "UN 1013". This marking is displayed within a diamond-shaped area surrounded by a line that measures at least 100 mm by 100 mm.
- 654 Waste lighters collected separately and consigned in accordance with 5.4.1.1.3 may be carried under this entry for the purposes of disposal. They need not be protected against inadvertent discharge provided that measures are taken to prevent the dangerous build up of pressure and dangerous atmospheres.
- Waste lighters, other than those leaking or severely deformed, shall be packed in accordance with packing instruction P003 of ADR. In addition the following provisions shall apply:
- only rigid packagings of a maximum capacity of 60 litres shall be used;

- the packagings shall be filled with water or any other appropriate protection material to avoid any ignition;
- under normal conditions of carriage all ignition devices of the lighters shall fully be covered by the protection material;
- the packagings shall be adequately vented to prevent the creation of flammable atmosphere and the build up of pressure;
- the packages shall only be carried in ventilated or open wagons/vehicles or containers.

Leaking or severely deformed lighters shall be carried in salvage packagings, provided appropriate measures are taken to ensure there is no dangerous build up of pressure.

NOTE: Special provision 201 and special packing provisions PP84 and RR5 of packing instruction P002 in 4.1.4.1 of ADR do not apply to waste lighters.

- 800 Oil seeds, crushed seeds and seedcake containing vegetable oil, treated with solvents, not subject to spontaneous combustion, are allocated to UN No. 3175. These substances are not subject to ADN when they have been prepared or treated to ensure that they cannot give off dangerous gases in dangerous quantities (no risk of explosion) during carriage and when this is mentioned in the transport document.
- 801 Ferrosilicon with between 25 and 30% or more than 90% silicon content by mass is a dangerous substance of Class 4.3 for carriage in bulk or without packaging by inland navigation vessel.
- 802 See 7.1.4.10.

CHAPTER 3.4**DANGEROUS GOODS PACKED IN LIMITED QUANTITIES****3.4.1 General requirements**

3.4.1.1 Packagings used in accordance with 3.4.3 to 3.4.6 below, need only to conform to the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8 of ADR.

3.4.1.2 The maximum gross mass of a combination packaging shall not exceed 30 kg and for shrink and stretched wrapped trays shall not exceed 20 kg.

NOTE: The limit for combination packagings does not apply when LQ5 is issued.

3.4.1.3 Subject to the maximum limits in 3.4.1.2 and individual limits in table 3.4.6, dangerous goods may be packed together with other articles or substances, provided they will not react dangerously in the event of leakage.

3.4.2 When the code "LQ0" is shown in Column (7a) of Table A in Chapter 3.2 for a given substance or article, that substance or article is not exempted from any of the applicable provisions of ADN when it is packed in limited quantities, unless otherwise specified in these annexed Regulations.

3.4.3 Unless otherwise provided in this Chapter, when one of the codes "LQ1" or "LQ2" is shown in Column (7a) of Table A in Chapter 3.2 for a given substance or article, the provisions of other Chapters of ADN do not apply to the carriage of that substance or article, provided:

- (a) the provisions of 3.4.5 (a) to (c) are observed; with respect to these provisions, articles are considered to be inner packagings;
- (b) inner packagings meet the conditions of 6.2.5.1 and 6.2.6.1 to 6.2.6.3 of ADR.

3.4.4 Unless otherwise provided in this Chapter, when the code "LQ3" is shown in Column (7a) of Table A in Chapter 3.2 for a given substance, the provisions of other Chapters of ADN do not apply to the carriage of that substance, provided:

- (a) The substance is carried in combination packagings, the following outer packagings being allowed:
 - steel or aluminium drums with removable head;
 - steel or aluminium jerricans with removable head;
 - plywood or fibre drums;
 - plastics drums or jerricans with removable head;

- boxes of natural wood, plywood, reconstituted wood, fibreboard, plastics, steel or aluminium;

and be so designed that they meet the relevant construction requirements of 6.1.4 of ADR;

- (b) The maximum net quantities per inner packaging shown in columns (2) or (4) and per package in columns (3) or (5), where indicated, of table 3.4.6 are not exceeded;
- (c) Each package is clearly and durably marked with :
 - (i) the UN number of the goods contained therein, as given in Column (1) of Table A in Chapter 3.2, preceded by the letters "UN";
 - (ii) in the case of different goods with different UN numbers within a single package:
 - the UN numbers of the goods contained therein, preceded by the letters "UN", or
 - the letters "LQ"¹.

These markings shall be displayed within a diamond-shaped area surrounded by a line that measures at least 100 mm × 100 mm. The width of line forming the diamond shall be at least 2 mm; the number shall be at least 6 mm high. Where more than one substance assigned to different UN numbers are included in the package, the diamond shall be large enough to include each relevant UN number. If the size of the package so requires, the dimension may be reduced, provided the markings remain clearly visible.

3.4.5 Unless otherwise provided in this Chapter, when one of the codes "LQ4" to "LQ19" and "LQ22" to "LQ28" is shown in Column (7a) of Table A in Chapter 3.2 for a given substance, the provisions of other Chapters of ADN do not apply to the carriage of that substance, provided:

- (a) The substance is carried:
 - in combination packagings, corresponding to the prescriptions of 3.4.4 (a), or
 - in metal or plastics inner packagings which are not liable to break or be easily punctured, placed in shrink-wrapped or stretch-wrapped trays;
- (b) The maximum net quantities per inner packaging shown in columns (2) or (4) and per package in columns (3) or (5), where indicated, of table 3.4.6 are not exceeded;
- (c) Each package is clearly and durably marked as indicated in 3.4.4 (c).

¹ The letters "LQ" are an abbreviation of the English words "Limited Quantities". The letters "LQ" are not permitted by the IMDG Code or the ICAO Technical Instructions.

3.4.6 Table

Code	Combination packagings ^a Maximum net quantity		Inner packagings placed in shrink-wrapped or stretch-wrapped trays ^a Maximum net quantity	
	per inner packaging	per package ^b	per inner packaging	per package ^b
(1)	(2)	(3)	(4)	(5)
LQ0	No exemption under the conditions of 3.4.2.			
LQ1	120 ml		120 ml	
LQ2	1 l		1 l	
LQ3 ^c	500 ml	1 l	Not allowed	Not allowed
LQ4 ^c	3 l		1 l	
LQ5 ^c	5 l	Unlimited	1 l	
LQ6 ^c	5 l		1 l	
LQ7 ^c	5 l		5 l	
LQ8	3 kg		500 g	
LQ9	6 kg		3 kg	
LQ10	500 ml		500 ml	
LQ11	500 g		500 g	
LQ12	1 kg		1 kg	
LQ13	1 l		1 l	
LQ14	25 ml		25 ml	
LQ15	100 g		100 g	
LQ16	125 ml		125 ml	
LQ17	500 ml	2 l	100 ml	2 l
LQ18	1 kg	4kg	500 g	4 kg
LQ19	5 kg		5 kg	
LQ20	Reserved	Reserved	Reserved	Reserved
LQ21	Reserved	Reserved	Reserved	Reserved
LQ22	1 l		500 ml	
LQ23	3 kg		1 kg	
LQ24	6 kg		2 kg	
LQ25 ^d	1 kg		1 kg	
LQ26 ^d	500 ml	2 l	500 ml	2 l
LQ27	6 kg		6 kg	
LQ28	3 l		3 l	

^a See 3.4.1.2.

^b See 3.4.1.3.

^c In the case of homogenous mixtures of Class 3 containing water, the quantities specified relate only to the substance of Class 3 contained in those mixtures.

^d For UN Nos. 2315, 3151, 3152 and 3432 when carried in apparatus, the inner packaging quantities shall not be exceeded per piece of apparatus. The apparatus shall be carried in a leakproof packaging and the complete package shall conform to 3.4.4 (c). Shrink-wrapped and stretch-wrapped trays shall not be used for apparatus.

3.4.7 Overpacks containing packages conforming to 3.4.3, 3.4.4 or 3.4.5 shall be marked, as required by 3.4.4 (c) for each item of dangerous goods contained in the overpack, unless markings representative of all dangerous goods contained in the overpack are visible.

3.4.8 The requirements

- (a) of sub-section 5.2.1.9 on the placement of orientation arrows on packages;
 - (b) of sub-section 5.1.2.1 (b) on the placement of orientation arrows on overpacks; and
 - (c) of sub-section 7.5.1.5 of ADR on the orientation of packages
- shall be applicable also to packages and overpacks carried in accordance with this chapter.

3.4.9 Consignors of dangerous goods packed in limited quantities shall inform the carrier of the total gross mass of such goods to be consigned, in advance of carriage not involving maritime transport.

- 3.4.10
- (a) Transport units with a maximum mass exceeding 12 tonnes carrying packages with dangerous goods in limited quantities shall be marked in accordance with 3.4.12 at the front and at the rear except when orange-coloured plate marking is displayed in accordance with 5.3.2.
 - (b) Wagons carrying packages with dangerous goods in limited quantities shall be marked in accordance with 3.4.12 on both sides except when placards in accordance with section 5.3.1 are already affixed.
 - (c) Containers carrying packages with dangerous goods in limited quantities shall be marked in accordance with 3.4.12 on all four sides except.
 - when placards in accordance with section 5.3.1 are already affixed;
 - for small containers loaded on a wagon;
 - for containers loaded on a transport unit with a maximum mass less than or equal to 12 tonnes.

If the containers are loaded on a transport unit or wagon, the carrying transport unit or wagon need not be marked, except when the marking affixed to the containers is not visible from the outside of this carrying transport unit or wagon. In this latter case, the same marking shall also be affixed at the front and the rear of the carrying transport unit, or on both sides of the carrying wagon.

3.4.11 Markings specified in 3.4.10 may be dispensed with, if the total gross mass of the packages containing dangerous goods packed in limited quantities carried does not exceed 8 tonnes per transport unit, wagon or large container.

3.4.12 The marking shall consist of "LTD QTY"² in black letters not less than 65 mm high on a white background.

3.4.13 Markings according to chapter 3.4 of the IMDG Code are also acceptable for carriage in a transport chain including maritime carriage.

² The letters "LTD QTY" are an abbreviation of the English words "Limited Quantity".

CHAPTER 3.5

DANGEROUS GOODS PACKED IN EXCEPTED QUANTITIES

3.5.1 Excepted quantities

3.5.1.1 Excepted quantities of dangerous goods of certain classes, other than articles, meeting the provisions of this Chapter are not subject to any other provisions of ADN except for:

- (a) The training requirements in Chapter 1.3;
- (b) The classification procedures and packing group criteria in Part 2;
- (c) The packaging requirements of 4.1.1.1, 4.1.1.2, 4.1.1.4 and 4.1.1.6 of ADR.

NOTE: In the case of radioactive material, the requirements for radioactive material in excepted packages in 1.7.1.5 apply.

3.5.1.2 Dangerous goods which may be carried as excepted quantities in accordance with the provisions of this Chapter are shown in column 7b of Table A of Chapter 3.2 list by means of an alphanumeric code as follows:

Code	Maximum net quantity per inner packaging (in grams for solids and ml for liquids and gases)	Maximum net quantity per outer packaging (in grams for solids and ml for liquids and gases, or sum of grams and ml in the case of mixed packing)
E0	Not permitted as Excepted Quantity	
E1	30	1000
E2	30	500
E3	30	300
E4	1	500
E5	1	300

For gases, the volume indicated for inner packagings refers to the water capacity of the inner receptacle and the volume indicated for outer packagings refers to the combined water capacity of all inner packagings within a single outer packaging.

3.5.1.3 Where dangerous goods in excepted quantities for which different codes are assigned are packaged together the total quantity per outer packaging shall be limited to that corresponding to the most restrictive code.

3.5.2 Packagings

Packagings used for the carriage of dangerous goods in excepted quantities shall be in compliance with the following:

- (a) There shall be an inner packaging and each inner packaging shall be constructed of plastic (with a minimum thickness of 0.2 mm when used for liquids), or of glass, porcelain, stoneware, earthenware or metal (see also 4.1.1.2 of ADR) and the closure of each inner packaging shall be held securely in place with wire, tape or other positive means; any receptacle having a neck with moulded screw threads shall have a leak proof threaded type cap. The closure shall be resistant to the contents;
- (b) Each inner packaging shall be securely packed in an intermediate packaging with cushioning material in such a way that, under normal conditions of carriage, they cannot break, be punctured or leak their contents. The intermediate packaging shall completely contain the contents in case of breakage or leakage, regardless of package orientation. For liquids, the intermediate packaging shall contain sufficient absorbent material to absorb the entire contents of the inner packaging. In such cases, the absorbent material may be the cushioning material. Dangerous goods shall not react dangerously with cushioning, absorbent material and packaging material or reduce the integrity or function of the materials;
- (c) The intermediate packaging shall be securely packed in a strong, rigid outer packaging (wooden, fibreboard or other equally strong material);
- (d) Each package type shall be in compliance with the provisions in 3.5.3;
- (e) Each package shall be of such a size that there is adequate space to apply all necessary markings; and
- (f) Overpacks may be used and may also contain packages of dangerous goods or goods not subject to the requirements of ADN.

3.5.3 Tests for packages

3.5.3.1 The complete package as prepared for carriage, with inner packagings filled to not less than 95% of their capacity for solids or 98% for liquids, shall be capable of withstanding, as demonstrated by testing which is appropriately documented, without breakage or leakage of any inner packaging and without significant reduction in effectiveness:

- (a) Drops onto a rigid, non-resilient flat and horizontal surface from a height of 1.8 m:

- (i) Where the sample is in the shape of a box, it shall be dropped in each of the following orientations:
 - flat on the base;
 - flat on the top;
 - flat on the longest side;
 - flat on the shortest side;
 - on a corner;

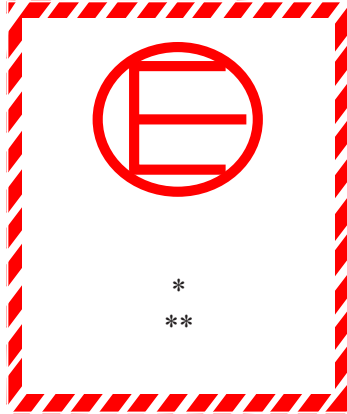
 - (ii) Where the sample is in the shape of a drum, it shall be dropped in each of the following orientations:
 - diagonally on the top chime, with the centre of gravity directly above the point of impact;
 - diagonally on the base chime;
 - flat on the side;
- NOTE: Each of the above drops may be performed on different but identical packages.*
- (b) A force applied to the top surface for a duration of 24 hours, equivalent to the total weight of identical packages if stacked to a height of 3 m (including the sample).

For the purposes of testing, the substances to be carried in the packaging may be replaced by other substances except where this would invalidate the results of the tests. For solids, when another substance is used, it must have the same physical characteristics (mass, grain size, etc.) as the substance to be carried. In the drop tests for liquids, when another substance is used, its relative density (specific gravity) and viscosity should be similar to those of the substance to be carried.

Marking of packages

- 3.5.4.1 Packages containing excepted quantities of dangerous goods prepared in accordance with this Chapter shall be durably and legibly marked with the mark shown in 3.5.4.2. The first or only label number indicated in column (5) of Table A of Chapter 3.2 for each of the dangerous goods contained in the package shall be shown in the mark. Where the name of the consignor or consignee is not shown elsewhere on the package this information shall be included within the mark.

3.5.4.2 The dimensions of the mark shall be a minimum of 100 mm × 100 mm.



Excepted quantities mark

Hatching and symbol of the same colour, black or red,
on white or suitable contrasting background

*The first or only label number indicated in column (5) of Table A of Chapter 3.2 shall be shown in this location.

**The name of the consignor or of the consignee shall be shown in this location if not shown elsewhere on the package.

3.5.4.3 An overpack containing dangerous goods in excepted quantities shall display the markings required by 3.5.4.1, unless such markings on packages within the overpack are clearly visible.

3.5.5 **Maximum number of packages in any vehicle, wagon or container**

The number of packages in any vehicle, wagon or container shall not exceed 1 000.

3.5.6 **Documentation**

If a document or documents (such as a bill of lading, air waybill or CMR/CIM consignment note) accompanies(y) dangerous goods in excepted quantities, at least one of these documents shall include the statement “Dangerous Goods in Excepted Quantities” and indicate the number of packages.

PART 4

Provisions concerning the use of packagings, tanks and bulk cargo transport units

CHAPTER 4.1

GENERAL PROVISIONS

- 4.1.1 Packagings and tanks shall be used in accordance with the requirements of one of the international Regulations, bearing in mind the indications given in the list of substances of these international Regulations, namely:
- For packagings (including IBCs and large packagings): columns (9a) and (9b) of Chapter 3.2, Table A of RID or ADR, or the list of substances in Chapter 3.2 of the IMDG Code or the ICAO Technical Instructions;
 - For portable tanks: columns (10) and (11) of Chapter 3.2, Table A of RID or ADR or the list of substances in the IMDG Code;
 - For RID or ADR tanks: columns (12) and (13) of Chapter 3.2, Table A of RID or ADR.
- 4.1.2 The requirements to be implemented are as follows:
- For packagings (including IBCs and large packagings): Chapter 4.1 of RID, ADR, the IMDG Code or the ICAO Technical Instructions;
 - For portable tanks: Chapter 4.2 of RID, ADR or the IMDG Code;
 - For RID or ADR tanks: Chapter 4.3 of RID or ADR, and, where applicable, sections 4.2.5 or 4.2.6 of the IMDG Code;
 - For fibre-reinforced plastics tanks: Chapter 4.4 of ADR;
 - For vacuum-operated waste tanks: Chapter 4.5 of ADR.
 - For mobile explosive manufacturing units (MEMUs): Chapter 4.7 of ADR.
- 4.1.3 For carriage in bulk of solids in vehicles, wagons or containers, the following requirements of the international Regulations shall be complied with:
- Chapter 4.3 of the IMDG Code; or
 - Chapter 7.3 of ADR, taking account of indications in columns (10) or (17) of Table A of Chapter 3.2 of ADR, except that sheeted vehicles and containers are not allowed;
 - Chapter 7.3 of RID, taking account of indications in columns (10) or (17) of Table A of Chapter 3.2 of RID, except that sheeted wagons and containers are not allowed.
- 4.1.4 Only packagings and tanks which meet the requirements of Part 6 of ADR or RID may be used.

PART 5

Consignment procedures

CHAPTER 5.1**GENERAL PROVISIONS****5.1.1 Application and general provisions**

This Part sets forth the provisions for dangerous goods consignments relative to marking, labelling, and documentation, and, where appropriate, authorisation of consignments and advance notifications.

5.1.2 Use of overpacks

5.1.2.1 (a) An overpack shall be:

- (i) marked with the word "OVERPACK"; and
- (ii) marked with the UN number preceded by the letters "UN", and labelled as required for packages in 5.2.2, for each item of dangerous goods contained in the overpack,

unless the UN numbers and the labels representative of all dangerous goods contained in the overpack are visible, except as required in 5.2.2.1.11. If the same UN number or the same label is required for different packages, it only needs to be applied once.

The marking of the word "OVERPACK", which shall be readily visible and legible, shall be in an official language of the country of origin and also, if that language is not English, French or German, in English, French or German, unless agreements, if any, concluded between the countries concerned in the transport operation provide otherwise.

(b) Orientation arrows illustrated in 5.2.1.9 shall be displayed on two opposite sides of the following overpacks:

- overpacks containing packages which shall be marked in accordance with 5.2.1.9.1, unless the marking remains visible, and
- overpacks containing liquids in packages which need not be marked in accordance with 5.2.1.9.2, unless the closures remain visible.

5.1.2.2 Each package of dangerous goods contained in an overpack shall comply with all applicable provisions of ADN. The intended function of each package shall not be impaired by the overpack.

5.1.2.3 The prohibitions on mixed loading also apply to these overpacks.

5.1.2.4 Each package bearing package orientation markings as prescribed in 5.2.1.9 and which is overpacked or placed in a large packaging shall be oriented in accordance with such markings.

5.1.3 Empty uncleaned packagings (including IBCs and large packagings), tanks, vehicles, wagons and containers for carriage in bulk

5.1.3.1 Empty uncleaned packagings (including IBCs and large packagings), tanks (including tank-vehicles, tank-wagons, battery-vehicles, battery-wagons, demountable tanks, portable tanks, tank-containers, MEGCs), vehicles, wagons and containers for carriage in bulk having

contained dangerous goods of the different classes other than Class 7, shall be marked and labelled as if they were full.

NOTE: For documentation, see Chapter 5.4.

5.1.3.2 Packagings, including IBCs and tanks, used for the carriage of radioactive material shall not be used for the storage or carriage of other goods unless decontaminated below the level of 0.4 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters and 0.04 Bq/cm² for all other alpha emitters.

5.1.4 Mixed packing

When two or more dangerous goods are packed within the same outer packaging, the package shall be labelled and marked as required for each substance or article. If the same label is required for different goods, it only needs to be applied once.

5.1.5 General provisions for Class 7

5.1.5.1 Approval of shipments and notification

5.1.5.1.1 General

In addition to the approval for package designs described in Chapter 6.4 of ADR, multilateral shipment approval is also required in certain circumstances (5.1.5.1.2 and 5.1.5.1.3). In some circumstances it is also necessary to notify competent authorities of a shipment (5.1.5.1.4).

5.1.5.1.2 Shipment approvals

Multilateral approval shall be required for:

- (a) the shipment of Type B(M) packages not conforming with the requirements of 6.4.7.5 of ADR or designed to allow controlled intermittent venting;
- (b) the shipment of Type B(M) packages containing radioactive material with an activity greater than 3000 A₁ or 3000 A₂, as appropriate, or 1000 TBq, whichever is the lower;
- (c) the shipment of packages containing fissile materials if the sum of the criticality safety indexes of the packages in a single vessel, vehicle, wagon or container exceeds 50;

except that a competent authority may authorise carriage into or through its country without shipment approval, by a specific provision in its design approval (see 5.1.5.2.1).

5.1.5.1.3 Shipment approval by special arrangement

Provisions may be approved by a competent authority under which a consignment, which does not satisfy all of the applicable requirements of ADN may be carried under special arrangement (see 1.7.4).

5.1.5.1.4 Notifications

Notification to competent authorities is required as follows:

- (a) Before the first shipment of any package requiring competent authority approval, the consignor shall ensure that copies of each applicable competent authority certificate applying to that package design have been submitted to the competent authority of

each country through or into which the consignment is to be carried. The consignor is not required to await an acknowledgement from the competent authority, nor is the competent authority required to make such acknowledgement of receipt of the certificate;

- (b) For each of the following types of shipments:
- (i) Type C packages containing radioactive material with an activity greater than 3000 A₁ or 3000 A₂, as appropriate, or 1000 TBq, whichever is the lower;
 - (ii) Type B(U) packages containing radioactive material with an activity greater than 3000 A₁ or 3000 A₂, as appropriate, or 1000 TBq, whichever is the lower;
 - (iii) Type B(M) packages;
 - (iv) Shipment under special arrangement.

The consignor shall notify the competent authority of each country through or into which the consignment is to be carried. This notification shall be in the hands of each competent authority prior to the commencement of the shipment, and preferably at least 7 days in advance;

- (c) The consignor is not required to send a separate notification if the required information has been included in the application for shipment approval;
- (d) The consignment notification shall include:
- (i) sufficient information to enable the identification of the package or packages including all applicable certificate numbers and identification marks;
 - (ii) information on the date of shipment, the expected date of arrival and proposed routing;
 - (iii) the name(s) of the radioactive material(s) or nuclide(s);
 - (iv) descriptions of the physical and chemical forms of the radioactive material, or whether it is special form radioactive material or low dispersible radioactive material; and
 - (v) the maximum activity of the radioactive contents during carriage expressed in becquerels (Bq) with an appropriate SI prefix symbol (see 1.2.2.1). For fissile material, the mass of fissile material in grams (g), or multiples thereof, may be used in place of activity.

5.1.5.2 *Certificates issued by the competent authority*

5.1.5.2.1 Certificates issued by the competent authority are required for the following:

- (a) Designs for:
- (i) special form radioactive material;
 - (ii) low dispersible radioactive material;
 - (iii) packages containing 0.1 kg or more of uranium hexafluoride;

- (iv) all packages containing fissile material unless excepted by 6.4.11.2 of ADR;
- (v) Type B(U) packages and Type B(M) packages;
- (vi) Type C packages;
- (b) Special arrangements;
- (c) Certain shipments (see 5.1.5.1.2).

The certificates shall confirm that the applicable requirements are met, and for design approvals shall attribute to the design an identification mark.

The package design and shipment approval certificates may be combined into a single certificate.

Certificates and applications for these certificates shall be in accordance with the requirements in 6.4.23 of ADR.

5.1.5.2.2 The consignor shall be in possession of a copy of each applicable certificate.

5.1.5.2.3 For package designs where a competent authority issued certificate is not required, the consignor shall, on request, make available for inspection by the competent authority, documentary evidence of the compliance of the package design with all the applicable requirements.

5.1.5.3 *Determination of transport index (TI) and criticality safety index (CSI)*

5.1.5.3.1 The transport index (TI) for a package, overpack or container, or for unpackaged LSA-I or SCO-I, shall be the number derived in accordance with the following procedure:

- (a) Determine the maximum radiation level in units of millisieverts per hour (mSv/h) at a distance of 1 m from the external surfaces of the package, overpack, container, or unpackaged LSA-I and SCO-I. The value determined shall be multiplied by 100 and the resulting number is the transport index. For uranium and thorium ores and their concentrates, the maximum radiation level at any point 1 m from the external surface of the load may be taken as:

0.4 mSv/h	for ores and physical concentrates of uranium and thorium;
0.3 mSv/h	for chemical concentrates of thorium;
0.02 mSv/h	for chemical concentrates of uranium, other than uranium hexafluoride;

- (b) For tanks, containers and unpackaged LSA-I and SCO-I, the value determined in step (a) above shall be multiplied by the appropriate factor from Table 5.1.5.3.1;
- (c) The value obtained in steps (a) and (b) above shall be rounded up to the first decimal place (e.g. 1.13 becomes 1.2), except that a value of 0.05 or less may be considered as zero.

Table 5.1.5.3.1: Multiplication factors for tanks, containers and unpackaged LSA-I and SCO-I

Size of load ^a	Multiplication factor
size of load $\leq 1 \text{ m}^2$	1
$1 \text{ m}^2 < \text{size of load} \leq 5 \text{ m}^2$	2
$5 \text{ m}^2 < \text{size of load} \leq 20 \text{ m}^2$	3
$20 \text{ m}^2 < \text{size of load}$	10

^a *Largest cross-sectional area of the load being measured.*

- 5.1.5.3.2 The transport index for each overpack, vessel or cargo transport unit shall be determined as either the sum of the TIs of all the packages contained, or by direct measurement of radiation level, except in the case of non-rigid overpacks for which the transport index shall be determined only as the sum of the TIs of all the packages.
- 5.1.5.3.3 The criticality safety index for each overpack or container shall be determined as the sum of the CSIs of all the packages contained. The same procedure shall be followed for determining the total sum of the CSIs in a consignment or aboard a vessel or cargo transport unit.
- 5.1.5.3.4 Packages and overpacks shall be assigned to either category I-WHITE, II-YELLOW or III-YELLOW in accordance with the conditions specified in Table 5.1.5.3.4 and with the following requirements:
- For a package or overpack, both the transport index and the surface radiation level conditions shall be taken into account in determining which is the appropriate category. Where the transport index satisfies the condition for one category but the surface radiation level satisfies the condition for a different category, the package or overpack shall be assigned to the higher category. For this purpose, category I-WHITE shall be regarded as the lowest category;
 - The transport index shall be determined following the procedures specified in 5.1.5.3.1 and 5.1.5.3.2;
 - If the surface radiation level is greater than 2 mSv/h, the package or overpack shall be carried under exclusive use and under the provisions of 7.1.4.14.7.1.3 and 7.1.4.14.7.3.5 (a) as appropriate;
 - A package carried under a special arrangement shall be assigned to category III-YELLOW except when otherwise specified in the competent authority approval certificate of the country of origin of design (see 2.2.7.2.4.6);
 - An overpack which contains packages carried under special arrangement shall be assigned to category III-YELLOW except when otherwise specified in the competent authority approval certificate of the country of origin of design (see 2.2.7.2.4.6).

Table 5.1.5.3.4: Categories of packages and overpacks

Conditions		
Transport index	Maximum radiation level at any point on external surface	Category
0 ^a	Not more than 0.005 mSv/h	I-WHITE
More than 0 but not more than 1 ^a	More than 0.005 mSv/h but not more than 0.5 mSv/h	II-YELLOW
More than 1 but not more than 10	More than 0.5 mSv/h but not more than 2 mSv/h	III-YELLOW
More than 10	More than 2 mSv/h but not more than 10 mSv/h	III-YELLOW ^b

^a If the measured TI is not greater than 0.05, the value quoted may be zero in accordance with 5.1.5.3.1(c).

^b Shall also be carried under exclusive use.

5.1.5.4 Summary of approval and prior notification requirements

NOTE 1: Before first shipment of any package requiring competent authority approval of the design, the consignor shall ensure that a copy of the approval certificate for that design has been submitted to the competent authority of each country en route (see 5.1.5.1.4 (a)).

NOTE 2: Notification required if contents exceed $3 \times 10^3 A_1$, or $3 \times 10^3 A_2$, or 1000 TBq (see 5.1.5.1.4 (b)).

NOTE 3: Multilateral approval of shipment required if contents exceed $3 \times 10^3 A_1$, or $3 \times 10^3 A_2$, or 1000 TBq, or if controlled intermittent venting is allowed (see 5.1.5.1).

NOTE 4: See approval and prior notification provisions for the applicable package for carrying this material.

Subject	UN Number	Competent Authority approval required		Consignor required to notify the competent authorities of the country of origin and of the countries en route ^a before each shipment	Reference
		Country of origin	Countries en route ^a		
Calculation of unlisted A ₁ and A ₂ values	-	Yes	Yes	No	-
Excepted packages - package design - shipment	2908, 2909, 2910, 2911	No No	No No	No No	-
LSA material ^b and SCO ^b Industrial packages types 1, 2 or 3, non fissile and fissile excepted - package design - shipment	2912, 2913, 3321, 3322	No No	No No	No No	-
Type A packages, ^b non fissile and fissile excepted - package design - shipment	2915, 3332	No No	No No	No No	-
Type B(U) packages, ^b non fissile and fissile excepted - package design - shipment	2916	Yes No	No No	See Note 1 See Note 2	5.1.5.1.4 (b), 5.1.5.2.1 (a) 6.4.22.2 (ADR)
Type B(M) packages, ^b non fissile and fissile excepted - package design - shipment	2917	Yes See Note 3	Yes See Note 3	No Yes	5.1.5.1.4 (b), 5.1.5.2.1 (a), 5.1.5.1.2. 6.4.22.3 (ADR)
Type C packages, ^b non fissile and fissile excepted - package design - shipment	3323	Yes No	No No	See Note 1 See Note 2	5.1.5.1.4 (b), 5.1.5.2.1 (a) 6.4.22.2 of ADR

Subject	UN Number	Competent Authority approval required		Consignor required to notify the competent authorities of the country of origin and of the countries en route ^a before each shipment	Reference
		Country of origin	Countries en route ^a		
Packages for fissile material - package design - shipment - sum of criticality safety indexes not more than 50 - sum of criticality safety indexes greater than 50	2977, 3324, 3325, 3326, 3327, 3328, 3329, 3330, 3331, 3333	Yes ^c	Yes ^c	No	5.1.5.2.1 (a), 5.1.5.1.2, 6.4.22.4 (ADR)
		No ^d	No ^d	See Note 2	
		Yes	Yes	See Note 2	
Special form radioactive material - design - shipment	- See Note 4	Yes See Note 4	No See Note 4	No See Note 4	1.6.6.3 (ADR), 5.1.5.2.1 (a) 6.4.22.5 (ADR)
Low dispersable radioactive material - design - shipment	- See Note 4	Yes See Note 4	No See Note 4	No See Note 4	5.1.5.2.1 (a), 6.4.22.5 of ADR
Packages containing 0.1 kg or more of uranium hexafluoride - design - shipment	- See Note 4	Yes See Note 4	No See Note 4	No See Note 4	5.1.5.2.1 (a), 6.4.22.1 of ADR
Special arrangement - shipment	2919, 3331	Yes	Yes	Yes	1.7.4.2, 5.1.5.2.1 (b), 5.1.5.1.4 (b)
Approved packages designs subjected to transitional measures	-	See 1.6.6	See 1.6.6	See Note 1	1.6.6.1, 1.6.6.2 (ADR), 5.1.5.1.4 (b), 5.1.5.2.1 (a), 5.1.5.1.2.

^a Countries from, through or into which the consignment is carried.

^b If the radioactive contents are fissile material which is not excepted from the provisions for packages containing fissile material, then the provisions for fissile material packages apply (see 6.4.11 of ADR).

^c Designs of packages for fissile material may also require approval in respect of one of the other items in the table.

^d Shipments may, however, require approval in respect of one of the other items in the table.

CHAPTER 5.2

MARKING AND LABELLING

5.2.1 Marking of packages

NOTE: For markings related to the construction, testing and approval of packagings, large packagings, pressure receptacles and IBCs, see Part 6 of ADR.

5.2.1.1 Unless provided otherwise in ADN, the UN number corresponding to the dangerous goods contained, preceded by the letters "UN" shall be clearly and durably marked on each package. In the case of unpackaged articles the marking shall be displayed on the article, on its cradle or on its handling, storage or launching device.

5.2.1.2 All package markings required by this Chapter:

- (a) shall be readily visible and legible;
- (b) shall be able to withstand open weather exposure without a substantial reduction in effectiveness.

5.2.1.3 Salvage packagings shall additionally be marked with the word "SALVAGE".

5.2.1.4 Intermediate bulk containers of more than 450 litres capacity and large packagings shall be marked on two opposite sides.

5.2.1.5 *Additional provisions for goods of Class 1*

For goods of Class 1, packages shall, in addition, bear the proper shipping name as determined in accordance with 3.1.2. The marking, which shall be clearly legible and indelible, shall be in an official language of the country of origin and also, if that language is not English, French or German, in English, French or German unless any agreements concluded between the countries concerned in the transport operation provide otherwise.

5.2.1.6 *Additional provisions for goods of Class 2*

Refillable receptacles shall bear the following particulars in clearly legible and durable characters:

- (a) the UN number and the proper shipping name of the gas or mixture of gases, as determined in accordance with 3.1.2.

In the case of gases classified under an N.O.S. entry, only the technical name¹ of the gas has to be indicated in addition to the UN number.

¹ *Instead of the proper shipping name or, if applicable, of the proper shipping name of the n.o.s. entry followed by the technical name, the use of the following names is permitted:*

- *for UN No. 1078 refrigerant gas, n.o.s: mixture F1, mixture F2, mixture F3;*
- *for UN No. 1060 methylacetylene and propadiene mixtures, stabilized: mixture P1, mixture P2;*
- *for UN No. 1965 hydrocarbon gas mixture, liquefied, n.o.s: mixture A or butane, mixture A01 or butane, mixture A02 or butane, mixture A0 or butane, mixture A1, mixture B1, mixture B2, mixture B, mixture C or propane.*
- *for UN No. 1010 Butadienes, stabilized: 1,2-Butadiene, stabilized, 1,3-Butadiene, stabilized.*

In the case of mixtures, not more than the two constituents which most predominantly contribute to the hazards have to be indicated;

- (b) for compressed gases filled by mass and for liquefied gases, either the maximum filling mass and the tare of the receptacle with fittings and accessories as fitted at the time of filling, or the gross mass;
- (c) the date (year) of the next periodic inspection.

These marks can either be engraved or indicated on a durable information disk or label attached on the receptacle or indicated by an adherent and clearly visible marking such as by printing or by any equivalent process.

NOTE 1: See also 6.2.2.7 of ADR.

NOTE 2: For non refillable receptacles, see 6.2.2.8 of ADR.

5.2.1.7 Special marking provisions for goods of Class 7

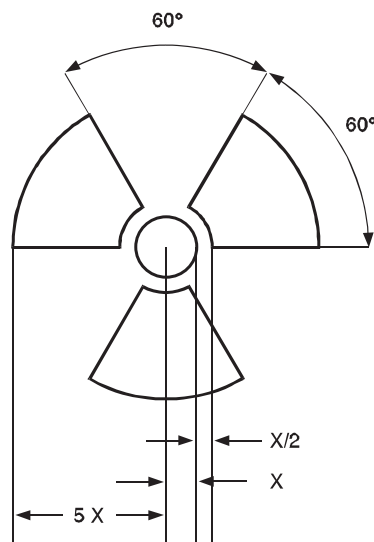
- 5.2.1.7.1 Each package shall be legibly and durably marked on the outside of the packaging with an identification of either the consignor or consignee, or both.
- 5.2.1.7.2 For each package, other than excepted packages, the UN number preceded by the letters "UN" and the proper shipping name shall be legibly and durably marked on the outside of the packaging. In the case of excepted packages only the UN number, preceded by the letters "UN", is required.
- 5.2.1.7.3 Each package of gross mass exceeding 50 kg shall have its permissible gross mass legibly and durably marked on the outside of the packaging.
- 5.2.1.7.4 Each package which conforms to:
 - (a) a Type IP-1 package, a Type IP-2 package or a Type IP-3 package design shall be legibly and durably marked on the outside of the packaging with "TYPE IP-1", "TYPE IP-2" or "TYPE IP-3" as appropriate;
 - (b) a Type A package design shall be legibly and durably marked on the outside of the packaging with "TYPE A";
 - (c) a Type IP-2 package, a Type IP-3 package or a Type A package design shall be legibly and durably marked on the outside of the packaging with the international vehicle registration code (VRI Code)² of the country of origin of design and either the name of the manufacturer or other identification of the packaging specified by the competent authority of the country of origin of design.
- 5.2.1.7.5 Each package which conforms to a design approved by the competent authority shall be legibly and durably marked on the outside of the packaging with:
 - (a) the identification mark allocated to that design by the competent authority;
 - (b) a serial number to uniquely identify each packaging which conforms to that design;

² *Distinguishing sign for motor vehicles in international traffic prescribed in the Vienna Convention on Road Traffic (1968).*

- (c) in the case of a Type B(U) or Type B(M) package design, with “TYPE B(U)” or “TYPE B(M)”;
- (d) in the case of a Type C package design, with “TYPE C”.

5.2.1.7.6 Each package which conforms to a Type B(U), Type B(M) or Type C package design shall have the outside of the outermost receptacle which is resistant to the effects of fire and water plainly marked by embossing, stamping or other means resistant to the effects of fire and water with the trefoil symbol shown in the figure below.

Basic trefoil symbol with proportions based on a central circle of radius X. The minimum allowable size of X shall be 4 mm.



5.2.1.7.7 Where LSA-I or SCO-I material is contained in receptacles or wrapping materials and is carried under exclusive use as permitted by 4.1.9.2.3 of ADR, the outer surface of these receptacles or wrapping materials may bear the marking “RADIOACTIVE LSA-I” or “RADIOACTIVE SCO-I”, as appropriate.

5.2.1.7.8 In case of international carriage of packages requiring competent authority design or shipment approval, for which different approval types apply in the different countries concerned, marking shall be in accordance with the certificate of the country of origin of the design.

5.2.1.8 Special marking provisions for environmentally hazardous substances

5.2.1.8.1 Packages containing environmentally hazardous substances meeting the criteria of 2.2.9.1.10 shall be durably and visibly marked with the environmentally hazardous substance mark shown in 5.2.1.8.3, with the exception of single packagings and combination packagings containing inner packagings with:

- contents of 5 l or less for liquids, or
- contents of 5 kg or less for solids.

5.2.1.8.2 The environmentally hazardous substance mark shall be located adjacent to the markings required by 5.2.1.1. The requirements of 5.2.1.2 and 5.2.1.4 shall be met.

- 5.2.1.8.3 The environmentally hazardous substance mark shall be as shown below. The dimensions shall be 100 mm × 100 mm, except in the case of packages of such dimensions that they can only bear smaller marks.



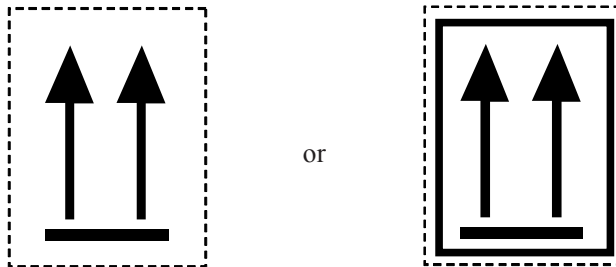
Symbol (fish and tree): black on white or suitable contrasting background

5.2.1.9 Orientation arrows

- 5.2.1.9.1 Except as provided in 5.2.1.9.2:

- combination packagings having inner packagings containing liquids;
- single packagings fitted with vents; and
- cryogenic receptacles intended for the carriage of refrigerated liquefied gases,

shall be legibly marked with package orientation arrows which are similar to the illustration shown below or with those meeting the specifications of ISO 780:1985. The orientation arrows shall appear on two opposite vertical sides of the package with the arrows pointing in the correct upright direction. They shall be rectangular and of a size that is clearly visible commensurate with the size of the package. Depicting a rectangular border around the arrows is optional.



Two black or red arrows on white or suitable contrasting background.
The rectangular border is optional.

- 5.2.1.9.2 Orientation arrows are not required on packages containing:

- (a) pressure receptacles except for cryogenic receptacles;
- (b) dangerous goods in inner packagings of not more than 120 ml which are prepared with sufficient absorbent material between the inner and outer packagings to completely absorb the liquid contents;
- (c) Class 6.2 infectious substances in primary receptacles of not more than 50 ml;
- (d) Class 7 radioactive material in Type IP-2, IP-3, A, B(U), B(M) or C packages; or
- (e) articles which are leak-tight in all orientations (e.g. alcohol or mercury in thermometers, aerosols, etc.).

5.2.1.9.3 Arrows for purposes other than indicating proper package orientation shall not be displayed on a package marked in accordance with this sub-section.

5.2.2 Labelling of packages

5.2.2.1 Labelling provisions

5.2.2.1.1 For each article or substance listed in Table A of Chapter 3.2, the labels shown in Column (5) shall be affixed unless otherwise provided for by a special provision in Column (6).

5.2.2.1.2 Indelible danger markings corresponding exactly to the prescribed models may be used instead of labels.

5.2.2.1.3-
5.2.2.1.5 (*Reserved*)

5.2.2.1.6 Except as provided in 5.2.2.1.2, each label shall:

- (a) be affixed to the same surface of the package, if the dimensions of the package allow; for packages of Class 1 and 7, near the mark indicating the proper shipping name;
- (b) be so placed on the package that it is not covered or obscured by any part or attachment to the packaging or any other label or marking; and
- (c) be displayed next to each other when more than one label is required.

Where a package is of such an irregular shape or small size that a label cannot be satisfactorily affixed, the label may be attached to the package by a securely affixed tag or other suitable means.

5.2.2.1.7 Intermediate bulk containers of more than 450 litres capacity and large packages shall be labelled on two opposite sides.

5.2.2.1.8 (*Reserved*)

5.2.2.1.9 *Special provisions for the labelling of self-reactive substances and organic peroxides*

- (a) the label conforming to model No. 4.1 also implies that the product may be flammable and hence no label conforming to model No. 3 is required. In addition, a label conforming to model No. 1 shall be applied for self-reactive substances Type B, unless the competent authority has permitted this label to be dispensed with for a specific packaging because test data have proven that the self-reactive substance in such a packaging does not exhibit explosive behaviour.
- (b) the label conforming to model No. 5.2 also implies that the product may be flammable and hence no label conforming to model No. 3 is required. In addition, the following labels shall be applied:
 - (i) a label conforming to model No. 1 for organic peroxides type B, unless the competent authority has permitted this label to be dispensed with for a specific packaging because test data have proven that the organic peroxide in such a packaging does not exhibit explosive behaviour;

- (ii) a label conforming to model No. 8 is required when Packing Group I or II criteria of Class 8 are met.

For self-reactive substances and organic peroxides mentioned by name, the labels to be affixed are indicated in the list found in 2.2.41.4 and 2.2.52.4 respectively.

5.2.2.1.10 *Special provisions for the labelling of infectious substances packages*

In addition to the label conforming to model No. 6.2, infectious substances packages shall bear any other label required by the nature of the contents.

5.2.2.1.11 *Special provisions for the labelling of radioactive material*

- 5.2.2.1.11.1 Except when enlarged labels are used in accordance with 5.3.1.1.3, each package, overpack and container containing radioactive material shall bear at least two labels which conform to the models Nos. 7A, 7B, and 7C as appropriate according to the category (see 5.1.5.3.4) of that package, overpack or container. Labels shall be affixed to two opposite sides on the outside of the package or on the outside of all four sides of the container. Each overpack containing radioactive material shall bear at least two labels on opposite sides of the outside of the overpack. In addition, each package, overpack and container containing fissile material, other than fissile material excepted under 6.4.11.2 of ADR shall bear labels which conform to model No. 7E; such labels, where applicable shall be affixed adjacent to the labels for radioactive material. Labels shall not cover the markings specified in 5.2.1. Any labels which do not relate to the contents shall be removed or covered.

- 5.2.2.1.11.2 Each label conforming to models Nos. 7A, 7B, and 7C shall be completed with the following information:

- (a) *Contents*:
 - (i) except for LSA-I material, the name(s) of the radionuclide(s) as taken from Table 2.2.7.2.2.1, using the symbols prescribed therein. For mixtures of radionuclides, the most restrictive nuclides shall be listed to the extent the space on the line permits. The group of LSA or SCO shall be shown following the name(s) of the radionuclide(s). The terms “LSA-II”, “LSA-III”, “SCO-I” and “SCO-II” shall be used for this purpose;
 - (ii) for LSA-I material, only the term “LSA-I” is necessary; the name of the radionuclide is not necessary;
- (b) *Activity*: The maximum activity of the radioactive contents during carriage expressed in becquerels (Bq) with the appropriate SI prefix symbol (see 1.2.2.1). For fissile material, the mass of fissile material in grams (g), or multiples thereof, may be used in place of activity;
- (c) For overpacks and containers the “contents” and “activity” entries on the label shall bear the information required in (a) and (b) above, respectively, totalled together for the entire contents of the overpack or container except that on labels for overpacks or containers containing mixed loads of packages containing different radionuclides, such entries may read “See Transport Documents”;
- (d) *Transport index (TI)*: The number determined in accordance with 5.1.5.3.1 and 5.1.5.3.2 (no transport index entry is required for category I-WHITE).

- 5.2.2.1.11.3 Each label conforming to the model No. 7E shall be completed with the criticality safety index (CSI) as stated in the certificate of approval for special arrangement or the certificate of approval for the package design issued by the competent authority.
- 5.2.2.1.11.4 For overpacks and containers, the criticality safety index (CSI) on the label shall bear the information required in 5.2.2.1.11.3 totalled together for the fissile contents of the overpack or container.
- 5.2.2.1.11.5 In case of international carriage of packages requiring competent authority design or shipment approval, for which different approval types apply in the different countries concerned, labelling shall be in accordance with the certificate of the country of origin of design.

5.2.2.2 *Provisions for labels*

- 5.2.2.2.1 Labels shall satisfy the provisions below and conform, in terms of colour, symbols and general format, to the models shown in 5.2.2.2.2. Corresponding models required for other modes of transport, with minor variations which do not affect the obvious meaning of the label, are also acceptable.

NOTE: Where appropriate, labels in 5.2.2.2.2 are shown with a dotted outer boundary as provided for in 5.2.2.2.1.1. This is not required when the label is applied on a background of contrasting colour.

- 5.2.2.2.1.1 Labels shall be in the form of a square set at an angle of 45° (diamond-shaped) with minimum dimensions of 100 mm by 100 mm. They shall have a line 5 mm inside the edge and running parallel with it. In the upper half of a label the line shall have the same colour as the symbol and in the lower half it shall have the same colour as the figure in the bottom corner. Labels shall be displayed on a background of contrasting colour, or shall have either a dotted or solid outer boundary line.
- 5.2.2.2.1.2 Gas cylinders for Class 2 may, on account of their shape, orientation and securing mechanisms for carriage, bear labels representative of those specified in this section, which have been reduced in size, according to the dimensions outlined in ISO 7225:2005, "Gas cylinders - Precautionary labels", for display on the non-cylindrical part (shoulder) of such cylinders.

Notwithstanding the provisions of 5.2.2.1.6, labels may overlap to the extent provided for by ISO 7225:2005. However, in all cases, the primary risk label and the figures appearing on any label shall remain fully visible and the symbols recognizable.

Empty uncleaned pressure receptacles for gases of Class 2 may be carried with obsolete or damaged labels for the purposes of refilling or inspection as appropriate and the application of a new label in conformity with current regulations or for the disposal of the pressure receptacle.

- 5.2.2.2.1.3 With the exception of labels for Divisions 1.4, 1.5 and 1.6 of Class 1, the upper half of the label shall contain the pictorial symbol and the lower half shall contain:
- For Classes 1, 2, 3, 5.1, 5.2, 7, 8 and 9, the class number;
 - For Classes 4.1, 4.2 and 4.3, the figure "4";
 - For Classes 6.1 and 6.2, the figure "6".

The label may include text such as the UN number or words describing the hazard (e.g. “flammable”) in accordance with 5.2.2.2.1.5 provided the text does not obscure or detract from the other required label elements.

- 5.2.2.2.1.4 In addition, except for Divisions 1.4, 1.5 and 1.6, labels for Class 1 shall show in the lower half, above the class number, the division number and the compatibility group letter for the substance or article. Labels for Divisions 1.4, 1.5 and 1.6 shall show in the upper half the division number, and in the lower half the class number and the compatibility group letter.
- 5.2.2.2.1.5 On labels other than those for material of Class 7, the optional insertion of any text (other than the class number) in the space below the symbol shall be confined to particulars indicating the nature of the risk and precautions to be taken in handling.
- 5.2.2.2.1.6 The symbols, text and numbers shall be clearly legible and indelible and shall be shown in black on all labels except for:
- (a) the Class 8 label, where the text (if any) and class number shall appear in white;
 - (b) labels with entirely green, red or blue backgrounds where they may be shown in white;
 - (c) the Class 5.2 label, where the symbol may be shown in white; and
 - (d) labels conforming to model No. 2.1 displayed on cylinders and gas cartridges for gases of UN Nos. 1011, 1075, 1965 and 1978, where they may be shown in the background colour of the receptacle if adequate contrast is provided.
- 5.2.2.2.1.7 All labels shall be able to withstand open weather exposure without a substantial reduction in effectiveness.

5.2.2.2.2 Specimen labels

CLASS 1 HAZARD

Explosive substances or articles



(No. 1)

Divisions 1.1, 1.2 and 1.3

Symbol (exploding bomb): black; Background: orange; Figure '1' in bottom corner



(No. 1.4)
Division 1.4



(No. 1.5)
Division 1.5



(No. 1.6)
Division 1.6

Background: orange; Figures: black; Numerals shall be about 30 mm in height and be about 5 mm thick (for a label measuring 100 mm x 100 mm); Figure '1' in bottom corner

- ** Place for division - to be left blank if explosive is the subsidiary risk
- * Place for compatibility group - to be left blank if explosive is the subsidiary risk

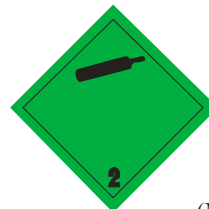
CLASS 2 HAZARD

Gases



(No. 2.1)
Flammable gases

Symbol (flame): black or white;
(except as provided for in 5.2.2.2.1.6 (d))
Background: red; Figure '2' in bottom corner



(No. 2.2)

Non flammable, non-toxic gases
Symbol (gas cylinder): black or white;
Background: green; Figure '2' in bottom corner



CLASS 3 HAZARD

Flammable liquids



(No. 2.3)
Toxic gases

Symbol (skull and crossbones): black;
Background: white; Figure '2' in bottom corner



(No. 3)

Symbol (flame): black or white;
Background: red; Figure '3' in bottom corner



CLASS 4.1 HAZARD
Flammable solids, self-reactive
substances and desensitized explosives



(No. 4.1)
Symbol (flame): black;
Background: white with
seven vertical red stripes;
Figure '4' in bottom corner

CLASS 4.2 HAZARD
Substances liable to
spontaneous combustion



(No. 4.2)
Symbol (flame): black;
Background: upper half white,
lower half red;
Figure '4' in bottom corner

CLASS 4.3 HAZARD
Substances which, in contact with water,
emit flammable gases



(No. 4.3)
Symbol (flame): black or white;
Background: blue;
Figure '4' in bottom corner



CLASS 5.1 HAZARD
Oxidizing substances



(No. 5.1)
Symbol (flame over circle): black;
Background: yellow;
Figure '5.1' in bottom corner

CLASS 5.2 HAZARD
Organic peroxides



(No. 5.2)
Symbol (flame): black or white;
Background: upper half red; lower half yellow;
Figure '5.2' in bottom corner



CLASS 6.1 HAZARD
Toxic substances



(No. 6.1)
Symbol (skull and crossbones): black;
Background: white; Figure '6' in bottom corner

CLASS 6.2 HAZARD
Infectious substances



(No. 6.2)
The lower half of the label may bear the inscriptions: 'INFECTIOUS SUBSTANCE'
and 'In the case of damage or leakage immediately notify Public Health Authority';
Symbol (three crescents superimposed on a circle) and inscriptions: black;
Background: white; Figure '6' in bottom corner

CLASS 7 HAZARD
Radioactive material



(No. 7A)
Category I - White
Symbol (trefoil): black;
Background: white;
Text (mandatory): black in lower half of label:
'RADIOACTIVE'
'CONTENTS'
'ACTIVITY'
One red bar shall
follow the word 'RADIOACTIVE';
Figure '7' in bottom corner.



(No 7B)
Category II - Yellow
Symbol (trefoil): black;
Background: upper half yellow with white border, lower half white;
Text (mandatory): black in lower half of label:

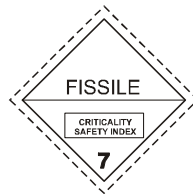
'RADIOACTIVE'
'CONTENTS'
'ACTIVITY'
In a black outlined box: 'TRANSPORT INDEX';
Two red vertical bars shall follow the word 'RADIOACTIVE';
Three red vertical bars shall follow the word 'RADIOACTIVE';
Figure '7' in bottom corner.



(No 7C)
Category III - Yellow

Symbol (trefoil): black;
Background: upper half yellow with white border, lower half white;
Text (mandatory): black in lower half of label:

'RADIOACTIVE'
'CONTENTS'
'ACTIVITY'
In a black outlined box: 'TRANSPORT INDEX';
Two red vertical bars shall follow the word 'RADIOACTIVE';
Three red vertical bars shall follow the word 'RADIOACTIVE';
Figure '7' in bottom corner.



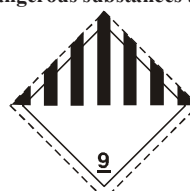
(No. 7E)
Class 7 fissile material
Background: white;
Text (mandatory): black in upper half of label: 'FISSILE';
In a black outlined box in the lower half of the label:
'CRITICALITY SAFETY INDEX'
Figure '7' in bottom corner.

CLASS 8 HAZARD
Corrosive substances



(No. 8)
Symbol (liquids, spilling from two glass vessels
and attacking a hand and a metal): black;
Background: upper half white;
lower half black with white border;
Figure '8' in bottom corner

CLASS 9 HAZARD
Miscellaneous dangerous substances and articles



(No. 9)
Symbol (seven vertical stripes in upper half): black;
Background: white;
Figure '9' underlined in bottom corner

CHAPTER 5.3**PLACARDING AND MARKING OF CONTAINERS, MEGCs,
TANK-CONTAINERS, PORTABLE TANKS, VEHICLES AND WAGONS**

NOTE: For marking and placarding of containers, MEGCs, tank-containers and portable tanks for carriage in a transport chain including a maritime journey, see also 1.1.4.2.1. If the provisions of 1.1.4.2.1 (c) are applied, only 5.3.1.3 and 5.3.2.1.1 of this Chapter are applicable.

5.3.1 Placarding**5.3.1.1 General provisions**

5.3.1.1.1 As and when required in this section, placards shall be affixed to the exterior surface of containers, MEGCs, tank-containers, portable tanks, vehicles and wagons. Placards shall correspond to the labels required in Column (5) and, where appropriate, Column (6) of Table A of Chapter 3.2 for the dangerous goods contained in the container, MEGC, tank-container, portable tank, vehicle or wagon and shall conform to the specifications given in 5.3.1.7. Placards shall be displayed on a background of contrasting colour, or shall have either a dotted or solid outer boundary line.

5.3.1.1.2 For Class 1, compatibility groups shall not be indicated on placards if the vehicle or wagon or container is carrying substances or articles belonging to two or more compatibility groups. Vehicles or wagons or containers carrying substances or articles of different divisions shall bear only placards conforming to the model of the most dangerous division in the order:

1.1 (most dangerous), 1.5, 1.2, 1.3, 1.6, 1.4 (least dangerous).

When 1.5D substances are carried with substances or articles of Division 1.2, the vehicle, wagon or container shall be placarded as Division 1.1.

Placards are not required for the carriage of explosives of Division 1.4, Compatibility Group S.

5.3.1.1.3 For Class 7, the primary risk placard shall conform to model No. 7D as specified in 5.3.1.7.2. This placard is not required for vehicles, wagons or containers carrying excepted packages and for small containers.

Where both Class 7 labels and placards would be required to be affixed to vehicles, wagons, containers, MEGCs, tank-containers or portable tanks, an enlarged label corresponding to the label required may be displayed instead of placard No. 7D to serve both purposes.

5.3.1.1.4 Containers, MEGCs, tank-containers, portable tanks, vehicles or wagons containing goods of more than one class need not bear a subsidiary risk placard if the hazard represented by that placard is already indicated by a primary or subsidiary risk placard.

5.3.1.1.5 Placards which do not relate to the dangerous goods being carried, or residues thereof, shall be removed or covered.

5.3.1.1.6 When the placarding is affixed to folding panels, they shall be designed and secured so that they cannot unfold or come loose from the holder during carriage (especially as a result of impacts or unintentional actions).

5.3.1.2 *Placarding of containers, MEGCs, tank-containers and portable tanks*

NOTE: This subsection does not apply to swap-bodies, except tank swap bodies carried on vehicles bearing the orange markings stipulated in 5.3.2.

The placards shall be affixed to both sides and at each end of the container, MEGC, tank-container or portable tank.

When the tank-container or portable tank has multiple compartments and carries two or more dangerous goods, the appropriate placards shall be displayed along each side at the position of the relevant compartments and one placard of each model shown on each side at both ends.

5.3.1.3 *Placarding of vehicles and wagons carrying containers, MEGCs, tank-containers or portable tanks*

NOTE: This subsection does not apply to swap-bodies, except tank swap bodies carried on vehicles bearing the orange markings stipulated in 5.3.2.

If the placards affixed to the containers, MEGCs, tank-containers or portable tanks are not visible from outside the carrying vehicles or wagons, the same placards shall also be affixed to both sides and at the rear of the vehicle or wagon. Otherwise, no placard need be affixed on the carrying vehicle or wagon.

5.3.1.4 *Placarding of vehicles for carriage in bulk, wagons for carriage in bulk, tank-vehicles, tank-wagons, battery vehicles, battery-wagons, vehicles with demountable tanks and wagons with demountable tanks*

Placards shall be affixed to both sides and at the rear of the vehicle, or, for wagons, to both sides.

When the tank-vehicle, tank-wagon, the demountable tank carried on the vehicle or the demountable tank carried on the wagon has multiple compartments and carries two or more dangerous goods, the appropriate placards shall be displayed along each side at the position of the relevant compartments and (vehicles only) one placard of each model shown on each side at the rear of the vehicle. However, in such case, if all compartments have to bear the same placards, these placards need be displayed only once along each side and (vehicles only) at the rear of the vehicle.

Where more than one placard is required for the same compartment, these placards shall be displayed adjacent to each other.

NOTE: When, a tank semi-trailer is separated from its tractor to be loaded on board a ship or a vessel, placards shall also be displayed at the front of the semi-trailer.

5.3.1.5 *Placarding of vehicles carrying packages only*

NOTE: This sub-section applies also to vehicles or wagons carrying swap-bodies loaded with packages.

5.3.1.5.1 For vehicles carrying packages containing substances or articles of Class 1 (other than of Division 1.4, Compatibility Group S), placards shall be affixed to both sides and at the rear of the vehicle.

- 5.3.1.5.2 For vehicles carrying radioactive material of Class 7 in packagings or IBCs (other than excepted packages), placards shall be affixed to both sides and at the rear of the vehicle.

NOTE: If a vehicle carrying packages containing dangerous goods of classes other than Classes 1 and 7 is loaded on board a vessel for an ADN journey preceding a voyage by sea, placards shall be affixed to both sides and at the rear of the vehicle. Such placards may remain affixed to a vehicle for an ADN journey following a sea voyage.

- 5.3.1.5.3 For wagons carrying packages, placards corresponding to the goods carried shall be affixed to both sides.

5.3.1.6 *Placarding of empty tank-vehicles, tank-wagons, vehicles with demountable tanks, wagons with demountable tanks, battery-vehicles, battery-wagons, MEGCs, tank-containers, portable tanks and empty vehicles, wagons and containers for carriage in bulk*

- 5.3.1.6.1 Empty tank-vehicles, tank-wagons, vehicles with demountable tanks, wagons with demountable tanks, battery-vehicles, battery-wagons, MEGCs, tank-containers and portable tanks uncleaned and not degassed, and empty vehicles, wagons and containers for carriage in bulk, uncleaned, shall continue to display the placards required for the previous load.

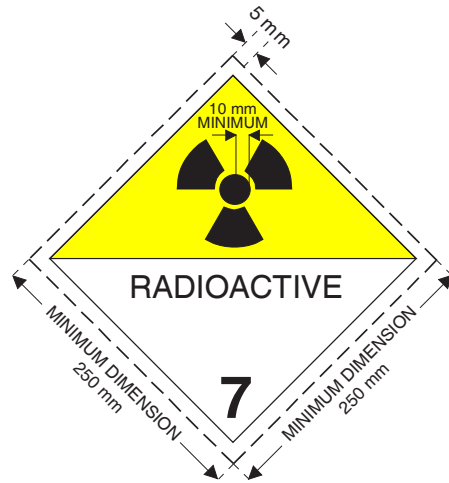
5.3.1.7 *Specifications for placards*

- 5.3.1.7.1 Except as provided in 5.3.1.7.2 for the Class 7 placard, a placard shall:

- (a) be not less than 250 mm by 250 mm and have a line 12.5 mm inside the edge and running parallel with it. In the upper half the line shall have the same colour as the symbol and in the lower half it shall have the same colour as the figure in the bottom corner;
- (b) correspond to the label required for the dangerous goods in question with respect to colour and symbol (see 5.2.2.2); and
- (c) display the numbers (and for goods of Class 1, the compatibility group letter) prescribed for the dangerous goods in question in 5.2.2.2 for the corresponding label, in digits not less than 25 mm high.

- 5.3.1.7.2 The Class 7 placard shall be not less than 250 mm by 250 mm with a black line running 5 mm inside the edge and parallel with it and is otherwise as shown below (Model No. 7D). The number “7” shall not be less than 25 mm high. The background colour of the upper half of the placard shall be yellow and of the lower half white, the colour of the trefoil and the printing shall be black. The use of the word “RADIOACTIVE” in the bottom half is optional to allow the use of this placard to display the appropriate UN number for the consignment.

Placard for radioactive material of Class 7



(No.7D)

Symbol (trefoil): black; Background: upper half yellow with white border, lower half white; The lower half shall show the word “RADIOACTIVE” or alternatively, when required, the appropriate UN Number (see 5.3.2.1.2) and the figure “7” in the bottom corner.

5.3.1.7.3 For tanks with a capacity of not more than 3 m³ and for small containers, placards may be replaced by labels conforming to 5.2.2.2.

5.3.1.7.4 For Classes 1 and 7, if the size and construction of the vehicle are such that the available surface area is insufficient to affix the prescribed placards, their dimensions may be reduced to 100 mm on each side. The dimensions of the placards to be affixed to wagons may be reduced to 150 mm by 150 mm. In this case, the upper dimensions prescribed for the trefoil, lines, figures and letters do not apply.

5.3.2 Orange-coloured plate marking

5.3.2.1 General orange-coloured plate marking provisions

5.3.2.1.1 Transport units carrying dangerous goods shall display two rectangular orange-coloured plates conforming to 5.3.2.2.1, set in a vertical plane. They shall be affixed one at the front and the other at the rear of the transport unit, both perpendicular to the longitudinal axis of the transport unit. They shall be clearly visible.

5.3.2.1.2 When a hazard identification number is indicated in Column (20) of Table A of Chapter 3.2 of ADR, tank-vehicles, battery vehicles or transport units having one or more tanks carrying dangerous goods shall in addition display on the sides of each tank, each tank compartment or each element of battery-vehicles, clearly visible and parallel to the longitudinal axis of the vehicle, orange-coloured plates identical with those prescribed in 5.3.2.1.1. These orange-coloured plates shall bear the hazard identification number and the UN number prescribed respectively in Columns (20) and (1) of Table A of Chapter 3.2 of ADR for each of the substances carried in the tank, in a compartment of the tank or in an element of a battery-vehicle.

The provisions of this paragraph are also applicable to tank-wagons, battery-wagons and wagons with demountable tanks. In the latter case the hazard identification number to be used is that indicated in column (20) of table A of Chapter 3.2 of RID.

5.3.2.1.3 For tank-vehicles or transport units having one or more tanks carrying substances with UN Nos. 1202, 1203 or 1223, or aviation fuel classed under UN Nos. 1268 or 1863, but no

other dangerous substance, the orange-coloured plates prescribed in 5.3.2.1.2 need not be affixed if the plates affixed to the front and rear in accordance with 5.3.2.1.1 bear the hazard identification number and the UN number prescribed for the most hazardous substance carried, i.e. the substance with the lowest flashpoint.

- 5.3.2.1.4 When a hazard identification number is indicated in Column (20) of Table A of Chapter 3.2 of ADR, transport units and containers carrying unpackaged solids or articles or packaged radioactive material with a single UN number under exclusive use and no other dangerous goods shall in addition display on the sides of each transport unit or container, clearly visible and parallel to the longitudinal axis of the vehicle, orange-coloured plates identical with those prescribed in 5.3.2.1.1. These orange-coloured plates shall bear the hazard identification number and the UN number prescribed respectively in Columns (20) and (1) of Table A of Chapter 3.2 of ADR for each of the substances carried in bulk in the transport unit or in the container or for the packaged radioactive material carried under exclusive use in the transport unit or in the container.

The provisions of this paragraph are also applicable to wagons for carriage in bulk and full wagon loads comprising packages containing only one substance. In the latter case the hazard identification number to be used is that indicated in Column (20) of Table A of Chapter 3.2 of RID.

- 5.3.2.1.5 If the orange-coloured plates prescribed in 5.3.2.1.2 and 5.3.2.1.4 affixed to the containers, tank-containers, MEGCs or portable tanks are not clearly visible from outside the carrying vehicle or wagon, the same plates shall also be affixed to both sides of the vehicle or wagon.

NOTE: This paragraph need not be applied to the marking with orange coloured plates of closed and sheeted wagons or vehicles, carrying tanks with a maximum capacity of 3 000 litres.

- 5.3.2.1.6 For transport units carrying only one dangerous substance and no non-dangerous substance, the orange-coloured plates prescribed in 5.3.2.1.2, 5.3.2.1.4 and 5.3.2.1.5 shall not be necessary provided that those displayed at the front and rear in accordance with 5.3.2.1.1 bear the hazard identification number and the UN number for that substance prescribed respectively in Columns (20) and (1) of Table A of Chapter 3.2 of ADR.

- 5.3.2.1.7 The requirements of 5.3.2.1.1 to 5.3.2.1.5 are also applicable to empty fixed or demountable tanks, battery-vehicles, tank-containers, portable tanks, MEGCs, tank-wagons, battery-wagons and wagons with demountable tanks, uncleaned, not degassed or not decontaminated as well as to empty vehicles, wagons and containers for carriage in bulk, uncleaned or not decontaminated.

- 5.3.2.1.8 Any orange-coloured marking which does not relate to dangerous goods carried, or residues thereof, shall be removed or covered. If plates are covered, the covering shall be total and remain effective after 15 minutes' engulfment in fire.

5.3.2.2 Specifications for the orange-coloured plates

- 5.3.2.2.1 The orange-coloured plates shall be reflectorized and shall be of 40 cm base and of 30 cm high; they shall have a black border of 15 mm wide. The material used shall be weather-resistant and ensure durable marking. The plate shall not become detached from its mount in the event of a 15 minutes' engulfment in fire. It shall remain affixed irrespective of the orientation of the vehicle or wagon. The orange-coloured plates may be separated in their middle with a black horizontal line of 15 mm thickness.

If the size and construction of the vehicle are such that the available surface area is insufficient to affix these orange-coloured plates, their dimensions may be reduced to 300

mm for the base, 120 mm for the height and 10 mm for the black border. In that case, for a packaged radioactive material carried under exclusive use, only the UN number is required, and the size of the digits stipulated in 5.3.2.2.2 may be reduced to 65 mm in height and 10 mm in stroke thickness.

A non-reflectorized colour is permitted for wagons.

For containers carrying dangerous solid substances in bulk and for tank-containers, MEGCs and portable tanks, the plates prescribed in 5.3.2.1.2, 5.3.2.1.4 and 5.3.2.1.5 may be replaced by a self-adhesive sheet, by paint or by any other equivalent process.

This alternative marking shall conform to the specifications set in this sub-section except for the provisions concerning resistance to fire mentioned in 5.3.2.2.1 and 5.3.2.2.2.

NOTE: *The colour of the orange plates in conditions of normal use should have chromaticity coordinates lying within the area on the chromaticity diagram formed by joining the following coordinates:*

<i>Chromaticity coordinates of points at the corners of the area on the chromaticity diagram</i>				
<i>x</i>	0.52	0.52	0.578	0.618
<i>y</i>	0.38	0.40	0.422	0.38

Luminance factor of reflectorized colour: $\beta > 0.12$.

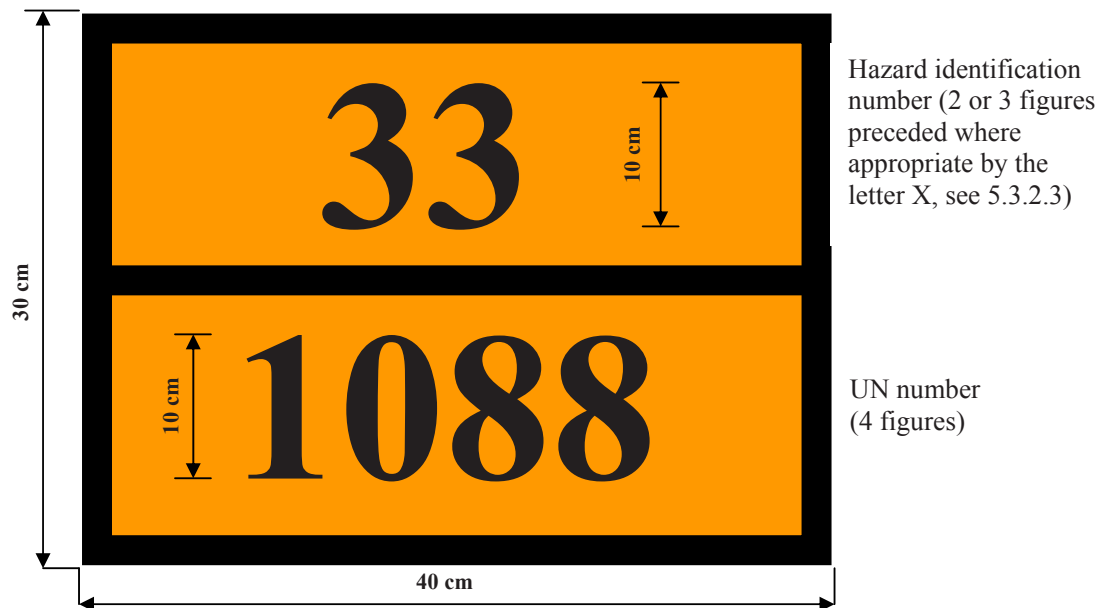
Luminance factor of non-reflectorized colour (wagons): $\beta \geq 0.22$

Reference centre E, standard illuminant C, normal incidence 45°, viewed at 0°.

Coefficient of reflex luminous intensity at an angle of illumination of 5°, viewed at 0.2°: not less than 20 candelas per lux per m² (not required for wagons).

5.3.2.2.2

The hazard identification number and the UN number shall consist of black digits 100 mm high and of 15 mm stroke thickness. The hazard identification number shall be inscribed in the upper part of the plate and the UN number in the lower part; they shall be separated by a horizontal black line, 15 mm in stroke width, extending from side to side of the plate at mid-height (see 5.3.2.2.3). The hazard identification number and the UN number shall be indelible and shall remain legible after 15 minutes engulfment in fire. Interchangeable numbers and letters on plates presenting the hazard identification number and the UN number shall remain in place during carriage and irrespective of the orientation of the wagon or vehicle.

5.3.2.2.3 *Example of orange-coloured plate with hazard identification number and UN number*

Background orange.

Border, horizontal line and figures black, 15 mm thickness.

5.3.2.2.4 The permitted tolerances for dimensions specified in this sub-section are $\pm 10\%$.

5.3.2.2.5 When the orange-coloured plate is affixed to folding panels, they shall be designed and secured so that they cannot unfold or come loose from the holder during carriage (especially as a result of impacts or unintentional actions).

5.3.2.3 *Meaning of hazard identification numbers*

5.3.2.3.1 The hazard identification number consists of two or three figures. In general, the figures indicate the following hazards:

2	Emission of gas due to pressure or to chemical reaction
3	Flammability of liquids (vapours) and gases or self-heating liquid
4	Flammability of solids or self-heating solid
5	Oxidizing (fire-intensifying) effect
6	Toxicity or risk of infection
7	Radioactivity
8	Corrosivity
9	Risk of spontaneous violent reaction

NOTE: The risk of spontaneous violent reaction within the meaning of figure 9 includes the possibility following from the nature of a substance of a risk of explosion, disintegration and polymerization reaction following the release of considerable heat or flammable and/or toxic gases.

Doubling of a figure indicates an intensification of that particular hazard.

Where the hazard associated with a substance can be adequately indicated by a single figure, this is followed by zero.

The following combinations of figures, however, have a special meaning: 22, 323, 333, 362, 382, 423, 44, 446, 462, 482, 539, 606, 623, 642, 823, 842, 90 and 99 (see 5.3.2.3.2 below).

If a hazard identification number is prefixed by the letter “X”, this indicates that the substance will react dangerously with water. For such substances, water may only be used by approval of experts.

For substances of Class 1, the classification code in accordance with Column (3 b) of Table A of Chapter 3.2, shall be used as the hazard identification number. The classification code consists of:

- the division number in accordance with 2.2.1.1.5; and
- the compatibility group letter in accordance with 2.2.1.1.6.

5.3.2.3.2 The hazard identification numbers listed in Column (20) of Table A of Chapter 3.2 of ADR or RID have the following meanings:

20	asphyxiant gas or gas with no subsidiary risk
22	refrigerated liquefied gas, asphyxiant
223	refrigerated liquefied gas, flammable
225	refrigerated liquefied gas, oxidizing (fire-intensifying)
23	flammable gas
238	flammable gas, corrosive
239	flammable gas, which can spontaneously lead to violent reaction
25	oxidizing (fire-intensifying) gas
26	toxic gas
263	toxic gas, flammable
265	toxic gas, oxidizing (fire-intensifying)
268	toxic gas, corrosive
28	gas, corrosive
285	gas, corrosive, oxidizing
30	flammable liquid (flashpoint between 23 °C and 60 °C, inclusive) or flammable liquid or solid in the molten state with a flashpoint above 60 °C, heated to a temperature equal to or above its flashpoint, or self-heating liquid
323	flammable liquid which reacts with water, emitting flammable gases
X323	flammable liquid which reacts dangerously with water, emitting flammable gases ¹
33	highly flammable liquid (flashpoint below 23 °C)
333	pyrophoric liquid
X333	pyrophoric liquid which reacts dangerously with water ¹
336	highly flammable liquid, toxic
338	highly flammable liquid, corrosive
X338	highly flammable liquid, corrosive, which reacts dangerously with water ¹
339	highly flammable liquid which can spontaneously lead to violent reaction
36	flammable liquid (flashpoint between 23 °C and 60 °C, inclusive), slightly toxic, or self-heating liquid, toxic
362	flammable liquid, toxic, which reacts with water, emitting flammable gases
X362	flammable liquid, toxic, which reacts dangerously with water, emitting flammable gases ¹
368	flammable liquid, toxic, corrosive
38	flammable liquid (flashpoint between 23 °C and 60 °C, inclusive), slightly corrosive or self-heating liquid, corrosive

¹ Water not to be used except by approval of experts.

382	flammable liquid, corrosive, which reacts with water, emitting flammable gases
X382	flammable liquid, corrosive, which reacts dangerously with water, emitting flammable gases ¹
39	flammable liquid, which can spontaneously lead to violent reaction
40	flammable solid, or self-reactive substance, or self-heating substance
423	solid which reacts with water, emitting flammable gases, or flammable solid which reacts with water, emitting flammable gases or self-heating solid which reacts with water, emitting flammable gases
X423	solid which reacts dangerously with water, emitting flammable gases, or flammable solid which reacts dangerously with water, emitting flammable gases, or self-heating solid which reacts dangerously with water, emitting flammable gases ¹
43	spontaneously flammable (pyrophoric) solid
X432	spontaneously flammable (pyrophoric) solid which reacts dangerously with water, emitting flammable gases ¹
44	flammable solid, in the molten state at an elevated temperature
446	flammable solid, toxic, in the molten state, at an elevated temperature
46	flammable or self-heating solid, toxic
462	toxic solid which reacts with water, emitting flammable gases
X462	solid which reacts dangerously with water, emitting toxic gases ¹
48	flammable or self-heating solid, corrosive
482	corrosive solid which reacts with water, emitting flammable gases
X482	solid which reacts dangerously with water, emitting corrosive gases ¹
50	oxidizing (fire-intensifying) substance
539	flammable organic peroxide
55	strongly oxidizing (fire-intensifying) substance
556	strongly oxidizing (fire-intensifying) substance, toxic
558	strongly oxidizing (fire-intensifying) substance, corrosive
559	strongly oxidizing (fire-intensifying) substance, which can spontaneously lead to violent reaction
56	oxidizing substance (fire-intensifying), toxic
568	oxidizing substance (fire-intensifying), toxic, corrosive
58	oxidizing substance (fire-intensifying), corrosive
59	oxidizing substance (fire-intensifying), which can spontaneously lead to violent reaction
60	toxic or slightly toxic substance
606	infectious substance
623	toxic liquid, which reacts with water, emitting flammable gases
63	toxic substance, flammable (flashpoint between 23 °C and 60 °C, inclusive)
638	toxic substance, flammable (flashpoint between 23 °C and 60 °C, inclusive), corrosive
639	toxic substance, flammable (flashpoint not above 60 °C) which can spontaneously lead to violent reaction
64	toxic solid, flammable or self-heating
642	toxic solid, which reacts with water, emitting flammable gases
65	toxic substance, oxidizing (fire-intensifying)
66	highly toxic substance
663	highly toxic substance, flammable (flashpoint not above 60 °C)
664	highly toxic solid, flammable or self-heating

¹ *Water not to be used except by approval of experts.*

665	highly toxic substance, oxidizing (fire-intensifying)
668	highly toxic substance, corrosive
669	highly toxic substance which can spontaneously lead to violent reaction
68	toxic substance, corrosive
69	toxic or slightly toxic substance, which can spontaneously lead to violent reaction
70	radioactive material
78	radioactive material, corrosive
80	corrosive or slightly corrosive substance
X80	corrosive or slightly corrosive substance, which reacts dangerously with water ¹
823	corrosive liquid which reacts with water, emitting flammable gases
83	corrosive or slightly corrosive substance, flammable (flashpoint between 23 °C and 60 °C, inclusive)
X83	corrosive or slightly corrosive substance, flammable, (flashpoint between 23 °C and 60 °C, inclusive), which reacts dangerously with water ¹
839	corrosive or slightly corrosive substance, flammable (flashpoint between 23 °C and 60 °C inclusive) which can spontaneously lead to violent reaction
X839	corrosive or slightly corrosive substance, flammable (flashpoint between 23 °C and 60 °C inclusive), which can spontaneously lead to violent reaction and which reacts dangerously with water ¹
84	corrosive solid, flammable or self-heating
842	corrosive solid which reacts with water, emitting flammable gases
85	corrosive or slightly corrosive substance, oxidizing (fire-intensifying)
856	corrosive or slightly corrosive substance, oxidizing (fire-intensifying) and toxic
86	corrosive or slightly corrosive substance, toxic
88	highly corrosive substance
X88	highly corrosive substance, which reacts dangerously with water ¹
883	highly corrosive substance, flammable (flashpoint between 23 °C and 60 °C inclusive)
884	highly corrosive solid, flammable or self-heating
885	highly corrosive substance, oxidizing (fire-intensifying)
886	highly corrosive substance, toxic
X886	highly corrosive substance, toxic, which reacts dangerously with water ¹
89	corrosive or slightly corrosive substance, which can spontaneously lead to violent reaction
90	environmentally hazardous substance; miscellaneous dangerous substances
99	miscellaneous dangerous substance carried at an elevated temperature.

5.3.3 Mark for elevated temperature substances

Tank-vehicles, tank-wagons, tank-containers, portable tanks, special vehicles, special wagons or special containers or especially equipped vehicles, especially equipped wagons or especially equipped containers for which a mark for elevated temperature substances is required according to special provision 580 in Column (6) of Table A of Chapter 3.2 shall bear on both sides for wagons, on both sides and at the rear for vehicles, and on both sides and at each end for containers, tank-containers and portable tanks, a triangular shaped mark with sides of at least 250 mm, to be shown in red, as reproduced below.

¹ *Water not to be used except by approval of experts.*



5.3.4 Marking for carriage in a transport chain including maritime transport

5.3.4.1 For carriage in a transport chain including maritime transport, containers, portable tanks and MEGCs are not required to carry the orange-coloured plate marking according to section 5.3.2 if they carry the marking prescribed in section 5.3.2 of the IMDG Code, where:

- (a) The proper shipping name of the contents is durably marked on at least two sides:
 - of portable tanks and MEGCs;
 - of containers for carriage in bulk;
 - of containers containing dangerous goods in packages constituting only one substance for which the IMDG Code does not require a placard or the marine pollutant mark;
- (b) The UN number for the goods is displayed in black digits not less than 65 mm high:
 - either on a white background in the lower half of the placards affixed to the cargo transport unit;
 - or on an orange rectangular panel not less than 120 mm high and 300 mm wide, with a 10 mm black border, to be placed immediately adjacent to the placard or the marine pollutant marks of the IMDG Code, or, if no placard or marine pollutant mark is prescribed, adjacent to the proper shipping name.

Example of marking for a portable tank carrying acetal,
class 3, UN No 1088, according to the IMDG Code

FIRST VARIANT



black flame on
red background

SECOND VARIANT



black flame on
red background



orange background
border and digits in black

- 5.3.4.2 If portable tanks, MEGCs or containers marked in accordance with 5.3.4.1 are carried on board a vessel loaded on vehicles, only paragraph 5.3.2.1.1 applies to the carrying vehicle.
- 5.3.4.3 In addition to the placards, orange-coloured plate marking and marks prescribed or permitted by ADN, cargo transport units may carry additional marks, placards and other markings prescribed where appropriate by the IMDG Code, for example, the marine pollutant mark or the "LIMITED QUANTITIES" mark.
- 5.3.5 *(Reserved)*
- 5.3.6 **Environmentally hazardous substance mark**

When a placard is required to be displayed in accordance with the provisions of section 5.3.1, containers, MEGCs, tank-containers, portable tanks, vehicles and wagons containing environmentally hazardous substances meeting the criteria of 2.2.9.1.10 shall be marked with the environmentally hazardous substance mark shown in 5.2.1.8.3. The provisions of section 5.3.1 concerning placards shall apply mutatis mutandis to the mark.

CHAPTER 5.4

DOCUMENTATION

5.4.0 Any carriage of goods governed by ADN shall be accompanied by the documentation prescribed in this Chapter, as appropriate, unless exempted under 1.1.3.1 to 1.1.3.5.

NOTE 1: For the list of documentation to be carried on board vessels, see 8.1.2.

NOTE 2: The use of electronic data processing (EDP) or electronic data interchange (EDI) techniques as an aid to or instead of paper documentation is permitted, provided that the procedures used for the capture, storage and processing of electronics data meet the legal requirements as regards the evidential value and availability of data during transport in a manner at least equivalent to that of paper documentation.

5.4.1 Dangerous goods transport document and related information

5.4.1.1 General information required in the transport document

5.4.1.1.1 General information required in the transport document for carriage in bulk or in packages

The transport document(s) shall contain the following information for each dangerous substance, material or article offered for carriage:

- (a) the UN number, preceded by the letters "UN" or substance identification number;
- (b) the proper shipping name supplemented, when applicable (see 3.1.2.8.1) with the technical name in brackets (see 3.1.2.8.1.1), as determined in accordance with 3.1.2.
- (c) – For substances and articles of Class 1: the classification code given in Column (3 b) of Table A of Chapter 3.2.

When, in Column (5) of Table A of Chapter 3.2, label model numbers are given other than 1, 1.4, 1.5 and 1.6, these label model numbers, in brackets, shall follow the classification code;

- For radioactive material of Class 7: the Class number: "7";

NOTE: For radioactive material with a subsidiary risk, see also special provision 172 in Chapter 3.3.

- For substances and articles of other classes: the label model numbers given in Column (5) of Table A of Chapter 3.2 or applicable according to a special provision referred to in Column (6). When more than one label model number is given, the numbers following the first one shall be given in brackets. For substances and articles for which no label model is given in Column (5) of Table A in Chapter 3.2, their class according to Column (3a) shall be given instead;

- (d) where assigned, the packing group for the substance which may be preceded by the letters "PG" (e.g. "PG II"), or the initials corresponding to the words "Packing Group" in the languages used according to 5.4.1.4.1;

NOTE: For radioactive material of Class 7 with subsidiary risks, see special provision 172 (b) in Chapter 3.3.

- (e) the number and a description of the packages when applicable. UN packaging codes may only be used to supplement the description of the kind of package (e.g. one box (4G));
- (f) the total quantity of each item of dangerous goods bearing a different UN number, proper shipping name (as a volume or as a gross mass, or as a net mass as appropriate);

NOTE: For dangerous goods in machinery and or equipment specified in these Regulations, the quantity indicated shall be the total quantity of dangerous goods contained therein in kilograms or litres as appropriate.

- (g) the name and address of the consignor;
- (h) the name and address of the consignee(s);
- (i) a declaration as required by the terms of any special agreement.

The location and order in which the elements of information required appear in the transport document is left optional, except that (a), (b), (c) and (d) shall be shown in the order listed above (i.e. (a), (b), (c), (d)) with no information interspersed, except as provided in ADN.

Examples of such permitted dangerous goods descriptions are:

**“UN 1098 ALLYL ALCOHOL, 6.1 (3), I” or
“UN1098, ALLYL ALCOHOL, 6.1 (3), PG I”**

The information required on a transport document shall be legible.

Although upper case is used in Chapter 3.1 and in Table A of Chapter 3.2 to indicate the elements which shall be part of the proper shipping name, and although upper and lower case are used in this Chapter to indicate the information required in the transport document, the use of upper or of lower case for entering the information in the transport document is left optional.

5.4.1.1.2 *General information required in the transport document for carriage in tank vessels*

The transport document(s) shall contain the following information for each dangerous substance or article offered for carriage:

- (a) the UN number preceded by the letters “UN” or the substance identification number;
- (b) the proper shipping name given in Column (2) of Table C of Chapter 3.2, supplemented, when applicable, by the technical name in parenthesis;
- (c) the data contained in column (5) of Table C of Chapter 3.2. When more than one number is given, the numbers following the first one shall be given in brackets;
- (d) where assigned, the packing group for the substance, which may be preceded by the letters ‘PG’ (e.g. ‘PG II’), or the initials corresponding to the words ‘Packing Group’ in the languages used in accordance with 5.4.1.4.1;
- (e) the mass in tonnes;
- (f) the name and address of the consignor;

(g) the name and address of the consignee(s).

The location and order in which the elements of information required appear in the transport document is left optional, except that (a), (b), (c) and (d) shall be shown in the order listed above (i.e. (a), (b), (c), (d)) with no information interspersed, except as provided in ADN.

Examples of such permitted dangerous goods descriptions are:

“UN 1230 METHANOL, 3 (6.1), II”, or
“UN 1230 METHANOL, 3 (6.1), PG II”.

The information required on a transport document shall be legible.

Although upper case is used in Chapter 3.1 and in Table C of Chapter 3.2 to indicate the elements which shall be part of the proper shipping name, and although upper and lower case are used in this Chapter to indicate the information required in the transport document, the use of upper or of lower case for entering the information in the transport document is left optional.

5.4.1.1.3 *Special provisions for wastes*

If waste containing dangerous goods (other than radioactive wastes) is being carried, the UN number and the proper shipping name shall be preceded by the word “WASTE”, unless this term is part of the proper shipping name, e.g.:

“WASTE, UN 1230 METHANOL, 3 (6.1), II”, or
“WASTE, UN 1230 METHANOL, 3 (6.1), PG II”, or
“WASTE, UN 1993 FLAMMABLE LIQUID, N.O.S., (toluene and ethyl alcohol), 3, II” or
“WASTE, UN 1993 FLAMMABLE LIQUID, N.O.S. (toluene and ethyl alcohol), 3, PG II”.

If the provision for waste as set out in 2.1.3.5.5 is applied, the following shall be added to the proper shipping name:

“WASTE IN ACCORDANCE WITH 2.1.3.5.5” (e.g. “UN 3264, CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S., 8, II, WASTE IN ACCORDANCE WITH 2.1.3.5.5”).

The technical name, as prescribed in Chapter 3.3, special provision 274, need not be added.

5.4.1.1.4 *Special provisions for dangerous goods packed in limited quantities*

No information is required in the transport document, if any, for carriage of dangerous goods packed in limited quantities according to Chapter 3.4.

5.4.1.1.5 *Special provisions for salvage packagings*

When dangerous goods are carried in a salvage packaging, the words “SALVAGE PACKAGE” shall be added after the description of the goods in the transport document.

5.4.1.1.6 *Special provision for empty means of containment and for empty cargo tanks of tank vessels*

5.4.1.1.6.1 For empty means of containment, uncleaned, which contain the residue of dangerous goods of classes other than Class 7, the words "EMPTY, UNCLEANED" or "RESIDUE, LAST

CONTAINED" shall be indicated before or after the proper shipping name required in 5.4.1.1.1 (b). Moreover, 5.4.1.1.1 (f) does not apply.

- 5.4.1.1.6.2 The special provision of 5.4.1.1.6.1 may be replaced with the provisions of 5.4.1.1.6.2.1, 5.4.1.1.6.2.2 or 5.4.1.1.6.2.3, as appropriate.
- 5.4.1.1.6.2.1 For empty packagings, uncleaned, which contain the residue of dangerous goods of classes other than Class 7, including empty uncleaned receptacles for gases with a capacity of not more than 1000 litres, the particulars according to 5.4.1.1.1 (a), (b), (c), (d), (e) and (f) are replaced with "EMPTY PACKAGING", "EMPTY RECEPTACLE", "EMPTY IBC" or "EMPTY LARGE PACKAGING", as appropriate, followed by the information of the goods last loaded, as described in 5.4.1.1.1 (c).

Example:

"EMPTY PACKAGING, 6.1 (3)".

In addition, in such a case, if the dangerous goods last loaded are goods of Class 2, the information prescribed in 5.4.1.1.1 (c) may be replaced by the number of the class "2".

- 5.4.1.1.6.2.2 For empty means of containment other than packagings, uncleaned, which contain the residue of dangerous goods of classes other than Class 7 and for empty uncleaned receptacles for gases with a capacity of more than 1000 litres, the particulars according to 5.4.1.1.1 (a) to (d) are preceded by "EMPTY TANK-WAGON", "EMPTY TANK-VEHICLE", "EMPTY DEMOUNTABLE TANK", "EMPTY TANK-CONTAINER", "EMPTY PORTABLE TANK", "EMPTY BATTERY-WAGON", "EMPTY BATTERY-VEHICLE", "EMPTY MEGC", "EMPTY WAGON", "EMPTY VEHICLE", "EMPTY CONTAINER" or "EMPTY RECEPTACLE", as appropriate, followed by the words "LAST LOAD:". Moreover, paragraph 5.4.1.1.1 (f) does not apply.

See example as follows:

**"EMPTY TANK-CONTAINER, LAST LOAD: UN 1098 ALLYL ALCOHOL, 6.1 (3), I" or
" EMPTY TANK-CONTAINER, LAST LOAD: UN 1098 ALLYL ALCOHOL, 6.1 (3), PG I".**

- 5.4.1.1.6.2.3 When empty means of containment, uncleaned, which contain the residue of dangerous goods of classes other than Class 7, are returned to the consignor, the transport documents prepared for the full-capacity carriage of these goods may also be used. In such cases, the indication of the quantity is to be eliminated (by effacing it, striking it out or any other means) and replaced by the words "EMPTY, UNCLEANED RETURN".
- 5.4.1.1.6.3 (a) If empty tanks, battery-vehicles, battery wagons and MEGCs, uncleaned, are carried to the nearest place where cleaning or repair can be carried out in accordance with the provisions of 4.3.2.4.3 of ADR or RID, the following additional entry shall be made in the transport document: **"Carriage in accordance with 4.3.2.4.3 of ADR (or RID)".**
- (b) If empty vehicles, wagons and containers, uncleaned, are carried to the nearest place where cleaning or repair can be carried out in accordance with the provisions of 7.5.8.1 of ADR or RID, the following additional entry shall be made in the transport document: **"Carriage in accordance with 7.5.8.1 of ADR (or RID)".**
- 5.4.1.1.6.4 For the carriage of tank wagons, fixed tanks (tank vehicles), wagons with removable tanks, vehicles with demountable tanks, battery-wagons, battery-vehicles, tank-containers and MEGCs under the conditions of 4.3.2.4.4 of ADR or RID, the following entry shall be

included in the transport document: "Carriage in accordance with 4.3.2.4.4 of ADR (or RID)" as appropriate.

5.4.1.1.6.5 For tank vessels with empty cargo tanks or cargo tanks that have been discharged, the master is deemed to be the consignor for the purpose of the transport documents required. In this case, the following particulars shall be entered on the transport document for each empty cargo tank or cargo tank that has been discharged:

- (a) the number of the cargo tank;
- (b) the UN number preceded by the letters "UN" or the substance identification number;
- (c) the proper shipping name of the last substance carried, the class and, if applicable, the packing group in accordance with 5.4.1.1.2.

5.4.1.1.7 *Special provisions for carriage in a transport chain including maritime, road, rail or air carriage*

For carriage in accordance with 1.1.4.2.1, a statement shall be included in the transport document, as follows: "**Carriage in accordance with 1.1.4.2.1**".

5.4.1.1.8-
5.4.1.1.9 *(Reserved)*

5.4.1.1.10 *(Deleted)*

5.4.1.1.11 *Special provisions for the carriage of IBCs or portable tanks after the date of expiry of the last periodic test or inspection*

For carriage in accordance with 4.1.2.2 (b), 6.7.2.19.6 (b), 6.7.3.15.6 (b) or 6.7.4.14.6 (b) of ADR or RID, a statement to this effect shall be included in the transport document, as follows: "Carriage in accordance with 4.1.2.2 (b) of ADR (or RID)", "Carriage in accordance with 6.7.2.19.6 (b) of ADR (or RID)", "Carriage in accordance with 6.7.3.15.6 (b) of ADR (or RID)" or "Carriage in accordance with 6.7.4.14.6 (b) of ADR (or RID)" as appropriate.

5.4.1.1.12-
5.4.1.1.13 *(Reserved)*

5.4.1.1.14 *Special provisions for the carriage of substances carried under elevated temperature*

If the proper shipping name of a substance which is carried or offered for carriage in a liquid state at a temperature equal to or exceeding 100 °C, or in a solid state at a temperature equal to or exceeding 240° C, does not convey the elevated temperature condition (for example, by using the term "**MOLTEN**" or "**ELEVATED TEMPERATURE**" as part of the proper shipping name), the word "**HOT**" shall immediately precede the proper shipping name.

5.4.1.1.15 *Special provisions for the carriage of substances stabilized by temperature control*

If the word "STABILIZED" is part of the proper shipping name (see also 3.1.2.6), when stabilization is by means of temperature control, the control and emergency temperatures (see 2.2.41.1.17) shall be indicated in the transport document, as follows:

"**Control temperature: ... °C** **Emergency temperature: ... °C**".

5.4.1.1.16 *Information required in accordance with special provision 640 in Chapter 3.3*

Where it is required by special provision 640 of Chapter 3.3, the transport document shall bear the inscription “**Special provision 640X**” where “X” is the capital letter appearing after the pertinent reference to special provision 640 in Column (6) of Table A of Chapter 3.2.

5.4.1.1.17 *Special provisions for the carriage of solids in bulk containers conforming to 6.11.4 of ADR*

When solid substances are carried in bulk containers conforming to 6.11.4 of ADR, the following statement shall be shown on the transport document (see NOTE at the beginning of 6.11.4 of ADR):

"Bulk container BK(x) approved by the competent authority of...".

5.4.1.1.18 *Special provisions for carriage in oil separator vessels and supply vessels*

5.4.1.1.2 and 5.4.1.1.6.3 are not applicable to oil separator vessels or supply vessels.

5.4.1.2 *Additional or special information required for certain classes*

5.4.1.2.1 *Special provisions for Class 1*

- (a) The transport document shall indicate, in addition to the requirements in 5.4.1.1.1 (f):
- the total net mass, in kg, of explosive contents¹ for each substance or article identified by its UN number;
 - the total net mass, in kg, of explosive contents¹ for all substances and articles covered by the transport document.
- (b) For mixed packing of two different goods, the description of the goods in the transport document shall include the UN numbers and names printed in capitals in Columns (1) and (2) of Table A of Chapter 3.2 of both substances or articles. If more than two different goods are contained in the same package in conformity with the mixed packing provisions given in 4.1.10 of ADR special provisions MP1, MP2 and MP20 to MP24, the transport document shall indicate under the description of the goods the UN numbers of all the substances and articles contained in the package, in the form, “**Goods of UN Nos. ...**”.
- (c) For the carriage of substances and articles assigned to an n.o.s. entry or the entry “0190 SAMPLES, EXPLOSIVE” or packed conforming to packing instruction P101 of 4.1.4.1 of ADR, a copy of the competent authority approval with the conditions of carriage shall be attached to the transport document. It shall be in an official language of the forwarding country and also, if that language is not English, French or German, in English, French or German unless agreements, if any, concluded between the countries concerned in the transport operation provide otherwise.
- (d) If packages containing substances and articles of compatibility groups B and D are loaded together in the same vehicle or wagon in accordance with the requirements of 7.5.2.2 or ADR or RID, the approval certificate of the protective compartment or containment system in accordance with 7.5.2.2, note ^a under the table of ADR or RID, shall be attached to the transport document. It shall be in an official language of the forwarding country and also, if that language is not English, French or German, in

¹ For articles, “explosive contents” means the explosive substance contained in the article.

A copy of the approval of the competent authority with the conditions of carriage shall be attached to the transport document.

5.4.1.2.3.4 When a sample of an organic peroxide (see 2.2.52.1.9) or a self-reactive substance (see 2.2.41.1.15) is carried, a statement to this effect shall be included in the transport document, e.g. **“Carriage in accordance with 2.2.52.1.9”**.

5.4.1.2.3.5 When self-reactive substances type G (see Manual of Tests and Criteria, Part II, paragraph 20.4.2 (g)) are carried, the following statement may be given in the transport document: **“Not a self-reactive substance of Class 4.1”**.

When organic peroxides type G (see Manual of Tests and Criteria, Part II, paragraph 20.4.3 (g)) are carried, the following statement may be given in the transport document: **“Not a substance of Class 5.2”**.

5.4.1.2.4 *Additional provisions for Class 6.2*

In addition to the information concerning the consignee (see 5.4.1.1.1 (h)), the name and telephone number of a responsible person shall be indicated.

5.4.1.2.5 *Additional provisions for Class 7*

5.4.1.2.5.1 The following information shall be inserted in the transport document for each consignment of Class 7 material, as applicable, in the order given and immediately after the information required under 5.4.1.1.1 (a) to (c):

- (a) The name or symbol of each radionuclide or, for mixtures of radionuclides, an appropriate general description or a list of the most restrictive nuclides;
- (b) A description of the physical and chemical form of the material, or a notation that the material is special form radioactive material or low dispersible radioactive material. A generic chemical description is acceptable for chemical form. For radioactive material with a subsidiary risk, see last sentence of special provision 172 of Chapter 3.3;
- (c) The maximum activity of the radioactive contents during carriage expressed in becquerels (Bq) with an appropriate SI prefix symbol (see 1.2.2.1). For fissile material, the mass of fissile material in grams (g), or appropriate multiples thereof, may be used in place of activity;
- (d) The category of the package, i.e. I-WHITE, II-YELLOW, III-YELLOW;
- (e) The transport index (categories II-YELLOW and III-YELLOW only);
- (f) For consignments including fissile material other than consignments excepted under 6.4.11.2 of ADR, the criticality safety index;
- (g) The identification mark for each competent authority approval certificate (special form radioactive material, low dispersible radioactive material, special arrangement, package design, or shipment) applicable to the consignment;
- (h) For consignments of more than one package, the information required in 5.4.1.1.1 and in (a) to (g) above shall be given for each package. For packages in an overpack, container, or conveyance, a detailed statement of the contents of each package within the overpack, container, or conveyance and, where appropriate, of each overpack,

container, or conveyance shall be included. If packages are to be removed from the overpack, container, or conveyance at a point of intermediate unloading, appropriate transport documents shall be made available;

- (i) Where a consignment is required to be shipped under exclusive use, the statement “**EXCLUSIVE USE SHIPMENT**”; and
- (j) For LSA-II and LSA-III substances, SCO-I and SCO-II, the total activity of the consignment as a multiple of A_2 .

5.4.1.2.5.2 The consignor shall provide in the transport documents a statement regarding actions, if any, that are required to be taken by the carrier. The statement shall be in the languages deemed necessary by the carrier or the authorities concerned, and shall include at least the following information:

- (a) Supplementary requirements for loading, stowage, carriage, handling and unloading of the package, overpack or container including any special stowage provisions for the safe dissipation of heat (see 7.1.4.14.7.3.2), or a statement that no such requirements are necessary;
- (b) Restrictions on the mode of carriage or vehicle or wagon and any necessary routing instructions;
- (c) Emergency arrangements appropriate to the consignment.

5.4.1.2.5.3 In case of international carriage of packages requiring competent authority design or shipment approval, for which different approval types apply in the different countries concerned, the UN number and proper shipping name required in 5.4.1.1.1 shall be in accordance with the certificate of the country of origin of design.

5.4.1.2.5.4 The applicable competent authority certificates need not necessarily accompany the consignment. The consignor shall make them available to the carrier(s) before loading and unloading.

5.4.1.3 *(Reserved)*

5.4.1.4 *Format and language*

5.4.1.4.1 The document containing the information in 5.4.1.1 and 5.4.1.2 may be that already required by other regulations in force for carriage by another mode of carriage. In case of multiple consignees, the name and address of the consignees and the quantities delivered enabling the nature and quantities carried to be evaluated at any time, may be entered in other documents which are to be used or in any other documents made mandatory according to other specific regulations and which shall be on board.

The particulars to be entered in the document shall be drafted in an official language of the forwarding country, and also, if that language is not English, French or German, in English, French or German, unless agreements concluded between the countries concerned in the transport operation, provide otherwise.

5.4.1.4.2 If by reason of the size of the load, a consignment cannot be loaded in its entirety on a single transport unit, at least as many separate documents, or copies of the single document, shall be made out as transport units loaded. Furthermore, in all cases, separate transport documents shall be made out for consignments or parts of consignments which may not be loaded together on the same vehicle by reason of the prohibitions set forth in 7.5.2 of ADR.

The information relative to the hazards of the goods to be carried (as indicated in 5.4.1.1) may be incorporated in, or combined with, an existing transport or cargo handling document. The layout of the information in the document (or the order of transmission of the corresponding data by electronic data processing (EDP) or electronic data interchange (EDI) techniques) shall be as provided in 5.4.1.1.1 or 5.4.1.1.2 as relevant.

When an existing transport document or cargo handling document cannot be used for the purposes of dangerous goods documentation for multimodal transport, the use of documents corresponding to the example shown in 5.4.4 is considered advisable.²

5.4.1.5 *Non-dangerous goods*

When goods mentioned by name in Table A of Chapter 3.2, are not subject to ADN because they are considered as non-dangerous according to Part 2, the consignor may enter in the transport document a statement to that effect, e.g.: “**Not goods of Class ...**”

NOTE: This provision may be used in particular when the consignor considers that, due to the chemical nature of the goods (e.g. solutions and mixtures) carried or to the fact that such goods are deemed dangerous for other regulatory purposes the consignment might be subject to control during the journey.

5.4.2 **Container packing certificate**

If the carriage of dangerous goods in a large container precedes a voyage by sea, a container packing certificate conforming to section 5.4.2 of the IMDG Code³ shall be provided with the transport document.⁴

² If used, the relevant recommendations of the UNECE United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) may be consulted, in particular Recommendation No. 1 (United Nations Layout Key for Trade Documents) (ECE/TRADE/137, edition 81.3), UN Layout Key for Trade Documents - Guidelines for Applications (ECE/TRADE/270, edition 2002), Recommendation No. 11 (Documentary Aspects of the International Transport of Dangerous Goods) (ECE/TRADE/204, edition 96.1 – currently under revision) and Recommendation No. 22 (Layout Key for Standard Consignment Instructions) (ECE/TRADE/168, edition 1989). Refer also to the UN/CEFACT Summary of Trade Facilitation Recommendations (ECE/TRADE/346, edition 2006) and the United Nations Trade Data Elements Directory (UNTDDED) (ECE/TRADE/362, edition 2005).

³ Guidelines for use in practice and in training for loading goods in transport units have also been drawn up by the International Maritime Organization (IMO), the International Labour Organization (ILO) and the United Nations Economic Commission for Europe (UNECE) and have been published by IMO (“IMO/ILO/UNECE Guidelines for Packing of Cargo Transport Units (CTUs)”).

⁴ Section 5.4.2 of the IMDG Code requires the following:

“5.4.2 Container/vehicle packing certificate

5.4.2.1 *When dangerous goods are packed or loaded into any container or vehicle, those responsible for packing the container or vehicle shall provide a “container/vehicle packing certificate” specifying the container/vehicle identification number(s) and certifying that the operation has been carried out in accordance with the following conditions:*

- .1 *The container/vehicle was clean, dry and apparently fit to receive the goods;*
- .2 *Packages, which need to be segregated in accordance with applicable segregation requirements, have not been packed together onto or in the container/vehicle*

The functions of the transport document required under 5.4.1 and of the container packing certificate as provided above may be incorporated into a single document; if not, these documents shall be attached one to the other. If these functions are incorporated into a single document, the inclusion in the transport document of a statement that the loading of the container has been carried out in accordance with the applicable modal regulations together with the identification of the person responsible for the container packing certificate shall be sufficient.

(unless approved by the competent authority concerned in accordance with 7.2.2.3 (of the IMDG Code));

- .3 All packages have been externally inspected for damage, and only sound packages have been loaded;*
- .4 Drums have been stowed in an upright position, unless otherwise authorised by the competent authority, and all goods have been properly loaded, and, where necessary, adequately braced with securing material to suit the mode(s) of transport for the intended journey;*
- .5 Goods loaded in bulk have been evenly distributed within the container/vehicle;*
- .6 For consignments including goods of class 1, other than division 1.4, the container/vehicle is structurally serviceable in conformity with 7.4.6 (of the IMDG Code);*
- .7 The container/vehicle and packages are properly marked, labelled, and placarded, as appropriate;*
- .8 When solid carbon dioxide (CO₂-dry ice) is used for cooling purposes, the container/vehicle is externally marked or labelled in a conspicuous place, such as, at the door end, with the words: "DANGEROUS CO₂ GAS (DRY ICE) INSIDE. VENTILATE THOROUGHLY BEFORE ENTERING"; and*
- .9 A dangerous goods transport document, as indicated in 5.4.1 (of the IMDG Code) has been received for each dangerous goods consignment loaded in the container/vehicle.*

NOTE: The container/vehicle packing certificate is not required for tanks.

5.4.2.2 The information required in the dangerous goods transport document and the container/vehicle packing certificate may be incorporated into a single document; if not, these documents shall be attached one to the other. If the information is incorporated into a single document, the document shall a signed declaration such as "It is declared that the packing of the goods into the container/vehicle has been carried out in accordance with the applicable provisions". This declaration shall be dated and the person signing this declaration shall be identified on the document. Facsimile signatures are acceptable where applicable laws and regulations recognize the legal validity of facsimile signatures.

5.4.2.3 If the dangerous goods documentation is presented to the carrier by means of electronic data processing (EDP) or electronic data interchange (EDI) transmission techniques, the signature(s) may be replaced by the name(s) (in capitals) of the person(s) authorized to sign."

NOTE: The container packing certificate is not required for portable tanks, tank-containers and MEGCs.









5.4.3 Instructions in writing






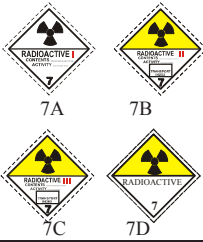



- 5.4.3.1** As an aid during an accident emergency situation that may occur or arise during carriage, instructions in writing in the form specified in 5.4.3.4 shall be carried in the wheelhouse and shall be readily available.
- 5.4.3.2** These instructions shall be provided by the carrier to the master in the language(s) that the master and the expert can read and understand before the commencement of the journey. The master shall ensure that each member of the crew concerned understands and is capable of carrying out the instructions properly.
- 5.4.3.3** Before the start of the journey, the members of the crew shall inform themselves of the dangerous goods loaded and consult the instructions in writing for details on actions to be taken in the event of an accident or emergency.
- 5.4.3.4** The instructions in writing shall correspond to the following four-page model as regards its form and contents.

INSTRUCTIONS IN WRITING
Actions in the event of an accident or incident

In the event of an accident or incident that may occur during carriage, the members of the crew shall take the following actions where safe and practicable to do so:

- Inform all other persons on board about the emergency and keep them away as much as possible from the danger zone. Alert other vessels in the vicinity;
- Avoid sources of ignition, in particular, do not smoke or switch on any electrical equipment that is not the “certified safe” type and is not designed for use in emergency response;
- Inform the appropriate body, giving as much information about the accident or incident and substances involved as possible;
- Keep the transport documents and the loading plan readily available for responders on arrival;
- Do not walk into or touch spilled substances and avoid inhalation of fumes, smoke, dusts and vapours by staying up wind;
- Where appropriate and safe to do so, tackle small/initial fires;
- Where appropriate and safe to do so, use on-board equipment to prevent leakages into the aquatic environment and contain spillages;
- Where necessary and safe to do so, secure the ship against drifting;
- Where appropriate, move away from the vicinity of the accident or incident, advise other persons to move away and follow the advice of the appropriate body;
- Remove any contaminated clothing and used contaminated protective equipment, dispose of it safely and wash the body by appropriate means;
- Observe the additional guidance assigned to the hazards of all concerned goods in the following table. For carriage in packages or in bulk, the hazards correspond to the number of the danger label model; for carriage in tank vessels to the data in accordance with 5.4.1.1.2 (c).

Additional guidance to members of the crew on the hazard characteristics of dangerous goods by class and on action subject to prevailing circumstances		
Danger labels and placards, description of the hazards	Hazard characteristics	Additional guidance
(1)	(2)	(3)
Explosive substances and articles  1 1.5 1.6	May have a range of properties and effects such as mass detonation; projection of fragments; intense fire/heat flux; formation of bright light, loud noise or smoke. Sensitive to shocks and/or impacts and/or heat.	Take cover but stay away from windows. Steer the vessel as far away as possible from infrastructure and inhabited areas.
Explosive substances and articles  1.4	Slight risk of explosion and fire.	Take cover.
Flammable gases  2.1	Risk of fire. Risk of explosion. May be under pressure. Risk of asphyxiation. May cause burns and/or frostbite. Containments may explode when heated.	Take cover. Keep out of low areas.
Non-flammable, non-toxic gases  2.2	Risk of asphyxiation. May be under pressure. May cause frostbite. Containments may explode when heated.	Take cover. Keep out of low areas.
Toxic gases  2.3	Risk of intoxication. May be under pressure. May cause burns and/or frostbite. Containments may explode when heated.	Use escape device. Take cover. Keep out of low areas.
Flammable liquids  3	Risk of fire. Risk of explosion. Containments may explode when heated.	Take cover. Keep out of low areas. Prevent leaking substances from running into the aquatic environment.
Flammable solids, self-reactive substances and solid desensitized explosives  4.1	Risk of fire. Flammable or combustible, may be ignited by heat, sparks or flames. May contain self-reactive substances that are liable to exothermic decomposition in the case of heat supply, contact with other substances (such as acids, heavy-metal compounds or amines), friction or shock. This may result in the evolution of harmful and flammable gases or vapours. Containments may explode when heated.	Prevent leaking substances from running into the aquatic environment.
Substances liable to spontaneous combustion  4.2	Risk of spontaneous combustion if packages are damaged or contents spilled. May react vigorously with water.	Spilled substances should be kept dry by covering the spillages

Danger labels and placards, description of the hazards	Hazard characteristics	Additional guidance
(1)	(2)	(3)
Substances which, in contact with water, emit flammable gases  4.3	Risk of fire and explosion in contact with water.	Spilled substances should be kept dry by covering the spillages.
Oxidizing substances  5.1	Risk of ignition and explosion. Risk of vigorous reaction in contact with flammable substances.	Avoid mixing with flammable or combustible substances (e.g. sawdust).
Organic peroxides  5.2	Risk of exothermic decomposition at elevated temperatures, contact with other substances (such as acids, heavy-metal compounds or amines), friction or shock. This may result in the evolution of harmful and flammable gases or vapours.	Avoid mixing with flammable or combustible substances (e.g. sawdust).
Toxic substances  6.1	Risk of intoxication. Risk to the aquatic environment.	Use escape device. Keep out of low areas.
Infectious substances  6.2	Risk of infection. Risk to the aquatic environment.	
Radioactive material  7A 7B 7C 7D	Risk of intake and external radiation.	Limit time of exposure.
Fissile material  7E	Risk of nuclear chain reaction.	Limit time of exposure.
Corrosive substances  8	Risk of chemical burns. May react vigorously with each other, with water and with other substances. Risk to the aquatic environment and sewage system.	Prevent leaking substances from running into the aquatic environment.
Miscellaneous dangerous substances and articles  9	Risk of burns. Risk of fire. Risk of explosion. Risk to the aquatic environment and sewage system.	Prevent leaking substances from running into the aquatic environment.

NOTE:

- For dangerous goods with multiple risks and for mixed loads, each applicable entry shall be observed.
- Additional guidance shown above may be adapted to reflect the classes of dangerous goods to be carried and their means of transport.
- Risks see also entries in the transport document as well as Chapter 3.2, Table C, Column 5.

Equipment for personal and general protection to carry out general actions and hazard specific emergency actions to be carried on board the vessel in accordance with section 8.1.5 of ADN

The equipment required by Chapter 3.2, Table A, Column 9 and Table C, Column 18 shall be carried on board the vessel for all hazards listed in the transport document.

5.4.4. Example of a multimodal dangerous goods form

Example of a form which may be used as a combined dangerous goods declaration and container packing certificate for multimodal carriage of dangerous goods.

CHAPTER 5.5

SPECIAL PROVISIONS

5.5.1 *(Deleted)*

5.5.2 **Special provisions for fumigated vehicles, wagons, containers and tanks**

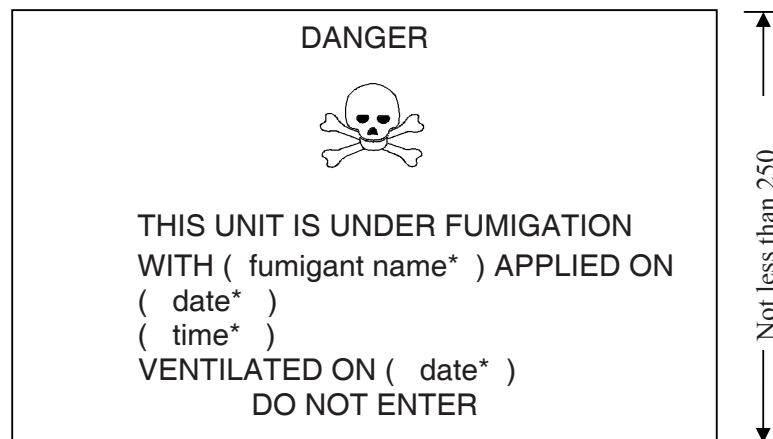
5.5.2.1 For the carriage of UN No. 3359 FUMIGATED UNIT (vehicle, wagon, container or tank) the transport document shall show the information required in 5.4.1.1.1, the date of fumigation and the type and amount of the fumigant used. These particulars shall be drafted in an official language of the forwarding country and also, if the language is not English, French or German, in English, French or German, unless agreements, if any, concluded between the countries concerned in the transport operation provide otherwise. In addition, instructions for disposal of any residual fumigant including fumigation devices (if used) shall be provided.

5.5.2.2 A warning sign as specified in 5.5.2.3 shall be placed on each fumigated vehicle, wagon, container or tank in a location where it will be easily seen by persons attempting to enter the interior of the vehicle, wagon, container or tank. The particulars concerning the warning sign shall be drafted in a language considered appropriate by the consignor. The warning sign, as required by this sub-section, shall remain on the wagon, vehicle, container or tank until the following provisions are met:

- (a) The fumigated wagon, vehicle, container or tank has been ventilated to remove harmful concentrations of fumigant gas; and
- (b) The fumigated goods or materials have been unloaded.

5.5.2.3 The fumigation warning sign shall be rectangular and shall not be less than 300 mm wide and not less than 250 mm high. The markings shall be black print on a white background with lettering not less than 25 mm high. An illustration of this sign is given in the figure below.

Fumigation warning sign



* Insert details as appropriate

← Not less than 300 mm →

PART 6

Requirements for the construction and testing of packagings (including IBCs and large packagings), tanks and bulk cargo transport units

CHAPTER 6.1**GENERAL REQUIREMENTS****6.1.1 Packagings (including IBCs and large packagings) and tanks shall meet the following requirements of ADR in respect of construction and testing:**

- Chapter 6.1: Requirements for the construction and testing of packagings;
- Chapter 6.2: Requirements for the construction and testing of pressure receptacles, aerosol dispensers, small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas;
- Chapter 6.3: Requirements for the construction and testing of packagings for Class 6.2 infectious substances of category A;
- Chapter 6.4: Requirements for the construction, testing and approval of packages and material of Class 7;
- Chapter 6.5: Requirements for the construction and testing of intermediate bulk containers (IBCs);
- Chapter 6.6: Requirements for the construction and testing of large packagings;
- Chapter 6.7: Requirements for the design, construction, inspection and testing of portable tanks and UN multiple-element gas containers (MEGCs);
- Chapter 6.8: Requirements for the construction, equipment, type approval, inspections and tests, and marking of fixed tanks (tank-vehicles), demountable tanks and tank-containers and tank swap bodies, with shell made of metallic materials and battery-vehicles and multiple element gas containers (MEGCs);
- Chapter 6.9: Requirements for the design, construction, equipment, type approval, testing and marking of fibre-reinforced plastics (FRP) fixed tanks (tank-vehicles), demountable tanks, tank-containers and tank swap bodies;
- Chapter 6.10: Requirements for the construction, equipment, type approval, inspection and marking of vacuum-operated waste tanks;
- Chapter 6.11: Requirements for the design, construction, inspection and testing of bulk containers;
- Chapter 6.12: Requirements for the construction, equipment, type approval, inspections and tests, and marking of tanks, bulk containers and special compartments for explosives of mobile explosive manufacturing units (MEMUs).

6.1.2 Portable tanks may also meet the requirements of Chapter 6.7 or, if appropriate, Chapter 6.9 of the IMDG Code.

6.1.3 Tank-vehicles may also meet the requirements of Chapter 6.8 of the IMDG Code.

6.1.4 Tank wagons, with fixed or removable tanks and battery-wagons shall meet the requirements of Chapter 6.8 of the RID.

6.1.5 Bodies of vehicles for bulk carriage shall, if necessary, meet the requirements of Chapter 6.11 or of Chapter 9.5 of ADR.

- 6.1.6 When the provisions of 7.3.1.1 (a) of RID or ADR are applied, the bulk containers shall meet the requirements of Chapter 6.11 of RID or ADR.

PART 7

Requirements concerning loading, carriage, unloading and handling of cargo

CHAPTER 7.1**DRY CARGO VESSELS****7.1.0 General requirements**

7.1.0.1 The provisions of 7.1.0 to 7.1.6 are applicable to dry cargo vessels.

7.1.0.2-
7.1.0.99 *(Reserved)*

7.1.1 Mode of carriage of goods

7.1.1.1-
7.1.1.9 *(Reserved)*

7.1.1.10 Carriage of packages

Unless otherwise specified, the masses given for packages shall be the gross masses. When packages are carried in containers or vehicles, the mass of the container or vehicle shall not be included in the gross mass of such packages.

7.1.1.11 Carriage in bulk

Carriage of dangerous goods in bulk shall be prohibited except where this mode of carriage is explicitly authorized in column (8) of Table A of Chapter 3.2. The code "B" shall then appear in this column.

7.1.1.12 Ventilation

The ventilation of holds is required only if it is prescribed in 7.1.4.12 or by an additional requirement "VE ..." in column (10) of Table A of Chapter 3.2.

7.1.1.13 Measures to be taken prior to loading

Additional measures to be taken prior to loading are required only if prescribed in 7.1.4.13 or by an additional requirement "LO ..." in column (11) of Table A of Chapter 3.2.

7.1.1.14 Handling and stowage of cargo

During the handling and stowage of cargo additional measures are required only if prescribed in 7.1.4.14 or by an additional requirement "HA ..." in column (11) of Table A of Chapter 3.2.

7.1.1.15 *(Reserved)*

7.1.1.16 Measures to be taken during loading, carriage, unloading and handling of cargo

The additional measures to be taken during loading, carriage, unloading and handling of cargo are required only if prescribed in 7.1.4.16 or by an additional requirement "IN ..." in column (11) of Table A of Chapter 3.2.

7.1.1.17 *(Reserved)*

7.1.1.18 *Carriage in containers, in intermediate bulk containers (IBCs) and in large packagings, in MEGCs, in portable tanks and in tank-containers*

The carriage of containers, IBCs, large packagings, MEGCs portable tanks and tank-containers shall be in accordance with the provisions applicable to the carriage of packages.

7.1.1.19 *Vehicles and wagons*

The carriage of vehicles and wagons shall be in accordance with the provisions applicable to the carriage of packages.

7.1.1.20 *(Reserved)*

7.1.1.21 *Carriage in cargo tanks*

The carriage of dangerous goods in cargo tanks in dry-cargo vessels is prohibited.

7.1.1.22-
7.1.1.99 *(Reserved)*

7.1.2 **Requirements applicable to vessels**

7.1.2.0 *Permitted vessels*

7.1.2.0.1 Dangerous goods may be carried in quantities not exceeding those indicated in 7.1.4.1.1, or, if applicable, in 7.1.4.1.2:

- In dry cargo vessels conforming to the applicable construction requirements of 9.1.0.0 to 9.1.0.79; or
- In seagoing vessels conforming to the applicable construction requirements of 9.1.0.0 to 9.1.0.79, or otherwise to the requirements of 9.2.0 to 9.2.0.79.

7.1.2.0.2 Dangerous goods of classes 2, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 7, 8 or 9, with the exception of those for which a No. 1 model label is required in column (5) of table A of Chapter 3.2, may be carried in quantities greater than those indicated in 7.1.4.1.1 and 7.1.4.1.2:

- In double-hull dry cargo vessels conforming to the applicable construction requirements of 9.1.0.80 to 9.1.0.95; or
- In double-hull seagoing vessels conforming to the applicable construction requirements of 9.1.0.80 to 9.1.0.95, or otherwise to the requirements of 9.2.0 to 9.2.0.95.

7.1.2.1-
7.1.2.4 *(Reserved)*

7.1.2.5 *Instructions for the use of devices and installations*

Where specific safety rules have to be complied with when using any device or installation, instructions for the use of the particular device or installation shall be readily available for consultation at appropriate places on board in the language normally spoken on board and also if that language is not English, French or German, in English, French or German unless agreements concluded between the countries concerned in the transport operation provide otherwise.

7.1.2.6-
7.1.2.18 *(Reserved)*

7.1.2.19 *Pushed convoys and side-by-side formations*

7.1.2.19.1 Where at least one vessel of a convoy or side-by-side formation is required to be in possession of a certificate of approval for the carriage of dangerous goods, all vessels of such convoy or side-by-side formation shall be provided with an appropriate certificate of approval.

Vessels not carrying dangerous goods shall comply with the requirements of the following paragraphs:

7.1.2.5, 8.1.5, 8.1.6.1, 8.1.6.3, 8.1.7, 8.1.8, 8.1.9, 9.1.0.0, 9.1.0.12.3, 9.1.0.17.2, 9.1.0.17.3, 9.1.0.31, 9.1.0.32, 9.1.0.34, 9.1.0.41, 9.1.0.52.2, 9.1.0.52.3, 9.1.0.56, 9.1.0.71 and 9.1.0.74.

7.1.2.19.2 For the purposes of the application of the provisions of this Part with the exception of 7.1.4.1.1 and 7.1.4.1.2, the entire pushed convoy or the side-by-side formation shall be deemed to be a single vessel.

7.1.2.20-
7.1.2.99 *(Reserved)*

7.1.3 **General service requirements**

7.1.3.1 *Access to holds, double-hull spaces and double bottoms; inspections*

7.1.3.1.1 Access to the holds is not permitted except for the purpose of loading or unloading and carrying out inspections or cleaning work.

7.1.3.1.2 Access to the double-hull spaces and the double bottoms is not permitted while the vessel is under way.

7.1.3.1.3 If the concentration of gases or the oxygen content of the air in holds, double-wall spaces or double bottoms has to be measured before entry the results of these measurements shall be recorded in writing. The measurement may only be effected by persons equipped with suitable breathing apparatus for the substance carried.

Entry into the spaces is not permitted for the purpose of measuring.

7.1.3.1.4 In case of suspected damage to packages, the gas concentration in holds containing dangerous goods of Classes 2, 3, 5.2, 6.1 and 8 for which EX and/or TOX appears in column (9) of Table A of Chapter 3.2, shall be measured before any person enters these holds.

7.1.3.1.5 The gas concentration in holds and in adjacent holds containing dangerous goods carried in bulk or without packaging for which EX and/or TOX appears in column (9) of Table A of Chapter 3.2, shall be measured before any person enters these holds.

7.1.3.1.6 Entry into holds where damage is suspected to packages in which dangerous goods of Classes 2, 3, 5.2, 6.1 and 8 are carried as well as entry into double-hull spaces and double bottoms is not permitted except where:

- there is no lack of oxygen and no measurable amount of dangerous substances in a dangerous concentration; or

- the person entering the space wears a self-contained breathing apparatus and other necessary protective and rescue equipment and is secured by a line. Entry into these spaces is only permitted if this operation is supervised by a second person for whom the same equipment is readily at hand. Another two persons capable of giving assistance in an emergency shall be on the vessel within calling distance.

7.1.3.1.7 Entry into holds where dangerous goods are carried in bulk or without packaging as well as entry into double-hull space and double bottoms is not permitted except where:

- there is no lack of oxygen and no measurable amount of dangerous substances in a dangerous concentration; or
- the person entering the space wears a self-contained breathing apparatus and other necessary protective and rescue equipment and is secured by a line. Entry into these spaces is only permitted if this operation is supervised by a second person for whom the same equipment is readily at hand. Another two persons capable of giving assistance in an emergency shall be on the vessel within calling distance.

7.1.3.2-
7.1.3.14 *(Reserved)*

7.1.3.15 *Expert on board the vessel*

When dangerous goods are carried an expert according to 8.2.1.2 shall be on board the vessel.

7.1.3.16-
7.1.3.19 *(Reserved)*

7.1.3.20 *Water ballast*

Double-hull spaces and double bottoms may be used for water ballast.

7.1.3.21 *(Reserved)*

7.1.3.22 *Opening of holds*

7.1.3.22.1 Dangerous goods shall be protected against the influences of weather and against spray water except during loading and unloading or during inspection.

This provision does not apply when dangerous goods are loaded in sprayproof containers, IBCs, or large packagings, or in MEGCs, portable tanks, tank-containers, vehicles or wagons which are closed or sheeted.

7.1.3.22.2 Where dangerous goods are carried in bulk, the holds shall be covered with hatch covers.

7.1.3.23-
7.1.3.30 *(Reserved)*

7.1.3.31 *Engines*

The use of engines running on fuels having a flash-point below 55° C (e.g. petrol engines) is prohibited.

This requirement does not apply to the petrol-operated outboard motors of lifeboats.

7.1.3.32 *Oil fuel tanks*

Double bottoms with a height of at least 0.6 m may be used as oil fuel tanks provided that they have been constructed in accordance with Chapters 9.1 or 9.2.

7.1.3.33-
7.4.3.40 *(Reserved)*

7.1.3.41 *Fire and naked light*

7.1.3.41.1 The use of fire or naked light is prohibited.

This provision does not apply to the accommodation and the wheelhouse.

7.1.3.41.2 Heating, cooking and refrigerating appliances shall not be fuelled with liquid fuels, liquid gas or solid fuels.

Cooking and refrigerating appliances may only be used in the accommodation and in the wheelhouse.

7.1.3.41.3 Heating appliances or boilers fuelled with liquid fuels having a flash-point above 55° C which are installed in the engine room or in another suitable space may, however, be used.

7.1.3.42 *Heating of holds*

The heating of holds or the operation of a heating system in the holds is prohibited.

7.1.3.43 *(Reserved)*

7.1.3.44 *Cleaning operations*

The use of liquids having a flash-point below 55° C for cleaning purposes is prohibited.

7.1.3.45-
7.1.3.50 *(Reserved)*

7.1.3.51 *Electrical installations*

7.1.3.51.1 The electrical installations shall be properly maintained.

7.1.3.51.2 The use of movable electric cables is prohibited in the protected area. This provision does not apply to:

- intrinsically safe electric circuits;
- electric cables for connecting signal lights or gangway lighting, provided the socket is permanently fitted to the vessel close to the signal mast or gangway;
- electric cables for connecting containers;
- electric cables for electrically operated hatch cover gantries;
- electric cables for connecting submerged pumps;
- electric cables for connecting hold ventilators.

7.1.3.51.3 The sockets for connecting the signal lights and gangway lighting and for connecting containers, submerged pumps, hatch cover gantries, or hold fans shall not be live except when the signal lights or the gangway lighting are switched on or when the containers or the submerged pumps or the hatch cover gantries or hold fans are in operation. In the protected area, connecting or disconnecting shall not be possible except when the sockets are not live.

7.1.3.51.4 The electrical installations in the holds shall be kept switched off and protected against unintentional connection.

This provision does not apply to permanently installed cables passing through the holds, to movable cables connecting containers, or to electrical apparatus of a “certified safe type”.

7.1.3.52-
7.1.3.69 *(Reserved)*

7.1.3.70 *Aerials, lightning conductors, wire cables and masts*

7.1.3.70.1 No part of an aerial for electronic apparatus, no lightning conductor and no wire cable shall be situated above the holds.

7.1.3.70.2 No part of aerials for radiotelephones shall be located within 2.00 m from substances or articles of Class 1.

7.1.3.71-
7.1.3.99 *(Reserved)*

7.1.4 *Additional requirements concerning loading, carriage, unloading and other handling of the cargo*

7.1.4.1 *Limitation of the quantities carried*

7.1.4.1.1 Subject to 7.1.4.1.3, the following gross masses shall not be exceeded on any vessel. For pushed convoys and side-by-side formations this gross mass applies to each unit of the convoy or formation.

Class 1

All substances and articles of Division 1.1 of compatibility group A	90 kg ¹
All substances and articles of Division 1.1 of compatibility groups B, C, D, E, F, G, J or L	15,000 kg ²
All substances and articles of Division 1.2 of compatibility groups B, C, D, E, F, G, H, J or L	50,000 kg
All substances and articles of Division 1.3 of compatibility groups C, G, H, J or L	300,000 kg ³
All substances and articles of Division 1.4 of compatibility groups B, C, D, E, F, G or S	1,100,000 kg
All substances of Division 1.5 of compatibility group D	15,000 kg ²
All articles of Division 1.6 of compatibility group N	300,000 kg ³
Empty packagings, uncleaned	1,100,000 kg

Note:

¹ In not less than three batches of a maximum of 30 kg each, distance between batches not less than 10.00 m.

² In not less than three batches of a maximum of 5 000 kg each, distance between batches not less than 10.00 m.

³ Not more than 100,000 kg per hold. A wooden partition is permitted for subdividing a hold.

Class 2

All goods for which label No. 2.1 is required in column (5) of Table A of Chapter 3.2: total	300 000 kg
All goods for which label No. 2.3 is required in column (5) of Table A of Chapter 3.2: total	120 000 kg
Other goods	No limitation

Class 3

All goods for which label No. 6.1 is required in column (5) of Table A of Chapter 3.2: total	120 000 kg
Other goods: total	300 000 kg

Class 4.1

UN Nos. 3221, 3222, 3231 and 3232, total	15 000 kg
All goods of packing group I; all goods of packing group II for which label No. 6.1 is required in column (5) of Table A of Chapter 3.2; self-reactive substances of types C, D, E and F (UN Nos. 3223 to 3230 and 3233 to 3240); other substances of classification code SR1 or SR2 (UN Nos. 2956, 3241, 3242 and 3251); and desensitized explosive substances of packing group II (UN Nos. 2907, 3319 and 3344): total	120 000 kg
Other goods	No limitation

Class 4.2

All goods of packing groups I or II for which label No. 6.1 is required in column (5) of Table A of Chapter 3.2: total	300 000 kg
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Other goods	No limitation
Class 4.3	
All goods of packing groups I or II for which label No. 3, 4.1 or 6.1 is required in column (5) of Table A of Chapter 3.2: total	300 000 kg
Other goods	No limitation
Class 5.1	
All goods of packing groups I or II for which label No. 6.1 is required in column (5) of Table A of Chapter 3.2: total	300 000 kg
Other goods	No limitation
Class 5.2	
UN Nos. 3101, 3102, 3111 and 3112: total	15 000 kg
Other goods: total	120 000 kg
Class 6.1	
All goods of packing group I: total	120 000 kg
All goods of packing group II: total	300 000 kg
Other goods	No limitation
Class 7	
UN Nos. 2912, 2913, 2915, 2916, 2917, 2919, 2977, 2978 and 3321 to 3333	0 kg
Other goods	No limitation
Class 8	
All goods of packing group I; goods of packing group II for which label No. 3 or 6.1 is required in column (5) of Table A in Chapter 3.2: total	300 000 kg
Other goods	No limitation
Class 9	
All goods of packing group II: total	300 000 kg
UN No. 3077, for goods carried in bulk and classified as hazardous to the aquatic environment, categories Acute 1 or Chronic 1, in accordance with 2.4.3:	0 kg
Other goods	No limitation

- 7.1.4.1.2 Subject to 7.1.4.1.3, the maximum quantity of dangerous goods permitted on board a vessel or on board each unit of a pushed convoy or side-by-side formation is 1,100,000 kg.
- 7.1.4.1.3 The limitations of 7.1.4.1.1 and 7.1.4.1.2 shall not apply in the case of transport of dangerous goods of classes 2, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 7, 8 and 9, except of those for which a label of Model No 1 is required in column (5) of Table A of Chapter 3.2, on board double-hull vessels complying with the additional requirements of 9.1.0.88 to 9.1.0.95 or 9.2.0.88 to 9.2.0.95.
- 7.1.4.1.4 Where substances and articles of different divisions of Class 1 are loaded in a single vessel in conformity with the provisions for prohibition of mixed loading of 7.1.4.3.3 or 7.1.4.3.4, the entire load shall not exceed the smallest maximum net mass given in 7.1.4.1.1 above for the goods of the most dangerous division loaded, the order of precedence being 1.1, 1.5, 1.2, 1.3, 1.6, 1.4.

7.1.4.1.5 Where the total net mass of the explosive substances carried and of explosive substances contained in articles carried is not known, the gross mass of the cargo shall apply to the mass mentioned in the table in 7.1.4.1.1 above.

7.1.4.1.6 For activity limits, transport index (TI) limits and criticality safety indices (CSI) in the case of the carriage of radioactive material, see 7.1.4.14.7.

7.1.4.2 Prohibition of mixed loading (bulk)

Vessels carrying substances of Class 5.1 in bulk shall not carry any other goods.

7.1.4.3 Prohibition of mixed loading (packages in holds)

7.1.4.3.1 Goods of different classes shall be separated by a minimum horizontal distance of 3.00 m. They shall not be stowed one on top of the other.

7.1.4.3.2 Irrespective of the quantity, dangerous goods for which marking with two blue cones or two blue lights is prescribed in column (12) of Table A of Chapter 3.2 shall not be stowed in the same hold together with flammable goods for which marking with one blue cone or one blue light is prescribed in column (12) of Table A of Chapter 3.2.

7.1.4.3.3 Packages containing substances or articles of Class 1 and packages containing substances of Classes 4.1 or 5.2 for which marking with three blue cones or three blue lights is prescribed in column (12) of Table A of Chapter 3.2 shall be separated by a distance of not less than 12 m from goods of all other classes.

7.1.4.3.4 Substances and articles of Class 1 shall not be stowed in the same hold, except as indicated in the following table:

Compatibility group	A	B	C	D	E	F	G	H	J	L	N	S
A	X	-	-	-	-	-	-	-	-	-	-	-
B	-	X	-	^{1/}	-	-	-	-	-	-	-	X
C	-	-	X	X	X	-	X	-	-	-	^{2/} , ^{3/}	X
D	-	^{1/}	X	X	X	-	X	-	-	-	^{2/} , ^{3/}	X
E	-	-	X	X	X	-	X	-	-	-	^{2/} , ^{3/}	X
F	-	-	-	-	-	X	-	-	-	-	-	X
G	-	-	X	X	X	-	X	-	-	-	-	X
H	-	-	-	-	-	-	-	X	-	-	-	X
J	-	-	-	-	-	-	-	-	X	-	-	X
L	-	-	-	-	-	-	-	-	-	^{4/}	-	-
N	-	-	^{2/} , ^{3/}	^{2/} , ^{3/}	^{2/} , ^{3/}	-	-	-	-	-	^{2/}	X
S	-	X	X	X	X	X	X	X	X	-	X	X

“X” indicates that explosive substances or articles of corresponding compatibility groups in accordance with Part 2 of these Regulations may be stowed in the same hold.

^{1/} Packages containing articles assigned to compatibility group B or substances or articles assigned to compatibility group D may be loaded together in the same hold provided that they are carried in containers or vehicles or wagons with complete metal walls.

^{2/} Different categories of articles of Division 1.6, compatibility group N, may be carried together as articles of Division 1.6, compatibility group N, only when it is proven by testing or analogy that there is no additional risk of sympathetic detonation between the articles. Otherwise they should be treated as hazard Division 1.1.

^{3/} When articles of compatibility group N are carried with substances or articles of compatibility groups C, D or E, the articles of compatibility group N should be considered as having the characteristics of compatibility group D.

^{4/} Packages with substances or articles of compatibility group L may be stowed in the same hold with packages containing the same type of substances or articles of the same compatibility group.

7.1.4.3.5 For the carriage of material Class 7 (UN Nos. 2916, 2917, 3323, 3328, 3329 and 3330) in Type B(U) or Type B(M) or Type C packages, the controls, restrictions or provisions specified in the competent authority approval certificate shall be complied with.

7.1.4.3.6 For the carriage of material of Class 7 under special arrangement (UN Nos. 2919 and 3331), the special provisions specified by the competent authority shall be met. In particular, mixed loading shall not be permitted unless specifically authorized by the competent authority.

7.1.4.4 *Prohibition of mixed loading (containers, vehicles, wagons)*

7.1.4.4.1 7.1.4.3 shall not apply to packages stowed in containers, vehicles or wagons in accordance with international regulations.

7.1.4.4.2 7.1.4.3 shall not apply to:

- closed containers with complete metal walls;
- closed vehicles and closed wagons with complete metal walls;
- tank-containers, portable tanks and MEGCs;
- tank-vehicles and tank-wagons.

7.1.4.4.3 For containers other than those referred to in paragraph 7.1.4.4.1 and 7.1.4.4.2 above the separation distance required by 7.1.4.3.1 may be reduced to 2.4 m (width of container).

7.1.4.5 *Prohibition of mixed loading (seagoing vessels)*

For seagoing vessels and inland waterway vessels, where the latter only carry containers, the prohibition of mixed loading shall be deemed to have been met if the stowage and segregation requirements of the IMDG Code have been complied with.

7.1.4.6 *(Reserved)*

7.1.4.7 *Places of loading and unloading*

7.1.4.7.1 The dangerous goods shall be loaded or unloaded only at the places designated or approved for this purpose by the competent authority.

7.1.4.7.2 When substances or articles of Class 1 and substances of Classes 4.1 or 5.2 for which marking with three blue cones or three blue lights is prescribed in column (12) of Table A of Chapter 3.2 are on board, no goods of any kind may be loaded or unloaded except at the places designated or permitted for this purpose by the competent authority.

7.1.4.8 *Time and duration of loading and unloading operations*

7.1.4.8.1 Loading and unloading operations of substances or articles of Class 1 and substances of Classes 4.1 or 5.2 for which marking with three blue cones or three blue lights is prescribed in column (12) of Table A of Chapter 3.2 shall not start without permission in writing from

the competent authority. This provision also applies to loading or unloading of other goods when substances or articles of Class 1 or substances of Classes 4.1 or 5.2 for which marking with three blue cones or three blue lights is prescribed in column (12) of Table A of Chapter 3.2 are on board.

7.1.4.8.2 Loading and unloading operations of substances or articles of Class 1 and substances of Classes 4.1 or 5.2, for which marking with three blue cones or three blue lights is prescribed in column (12) of Table A of Chapter 3.2, shall be suspended in the event of a storm.

7.1.4.9 *Cargo transshipment operations*

Partial or complete cargo transshipment into another vessel without permission from the competent authority is prohibited outside a cargo transshipment place approved for this purpose.

7.1.4.10 *Precautions with respect to foodstuffs, other articles of consumption and animal feeds*

7.1.4.10.1 When special provision 802 is indicated for a dangerous good in column (6) of Table A of Chapter 3.2, precautions shall be taken as follows with respect to foodstuffs, other articles of consumption and animal feeds:

Packages as well as uncleaned empty packagings, including large packagings and intermediate bulk containers (IBCs), bearing labels conforming to models Nos. 6.1 or 6.2, and those bearing labels of Class 9, containing substances of Class 9, UN Nos. 2212, 2315, 2590, 3151, 3152 or 3245, shall not be stacked on or loaded in immediate proximity to packages known to contain foodstuffs, other articles of consumption or animal feeds in the same hold and at places of loading and unloading or trans-shipment.

When these packages, bearing the said labels, are loaded in immediate proximity of packages known to contain foodstuffs, other articles of consumption or animal feeds, they shall be kept apart from the latter:

- (a) by complete partitions which should be as high as the packages bearing the said labels, or
- (b) by packages not bearing labels conforming to models Nos. 6.1, 6.2 or 9 or packages bearing labels of Class 9 but not containing substances of that class, UN Nos. 2212, 2315, 2590, 3151, 3152 or 3245, or
- (c) by a space of at least 0.8 m,

unless the packages bearing said labels are provided with an additional packaging or are completely covered (e.g. by a sheeting, a fibreboard cover or other measures).

7.1.4.11 *Stowage plan*

7.1.4.11.1 The master shall enter on a stowage plan the dangerous goods stowed in the individual holds or on deck. The goods shall be described as in the transport document in accordance with 5.4.1.1.1 (a), (b), (c) and (d).

7.1.4.11.2 Where the dangerous goods are transported in containers, the number of the container shall suffice. In this case, the stowage plan shall contain as an annex a list of all containers with their numbers and the description of the goods contained therein in accordance with 5.4.1.1.1 (a), (b), (c) and (d).

7.1.4.12 *Ventilation*

- 7.1.4.12.1 During loading or unloading of road vehicles into or from the holds of ro-ro-vessels, there shall be not less than five changes of air per hour based upon the total volume of the empty hold.
- 7.1.4.12.2 On board vessels carrying dangerous goods only in containers placed in open holds, ventilators do not require to be incorporated but must be on board. Where damage of the container or release of content inside the container is suspected, the holds shall be ventilated so as to reduce the concentration of gases given off by the cargo to less than 10% of the lower explosive limit or in the case of toxic gases to below any significant concentration.
- 7.1.4.12.3 If tank-containers, portable tanks, MEGCs, tank vehicles or tank wagons are carried in closed holds, such holds shall be permanently ventilated for ensuring five air changes per hour.

7.1.4.13 *Measures to be taken before loading*

The holds and cargo areas shall be cleaned prior to loading. The holds shall be ventilated.

7.1.4.14 *Handling and stowage of the cargo*

- 7.1.4.14.1 The various components of the cargo shall be stowed such as to prevent them from shifting in relation to one another or to the vessel and such that no damage can be caused by other cargo.
- 7.1.4.14.1.1 Packages containing dangerous substances and unpackaged dangerous articles shall be secured by suitable means capable of restraining the goods (such as fastening straps, sliding slatboards, adjustable brackets) in a manner that will prevent any movement during carriage which would change the orientation of the packages or cause them to be damaged. When dangerous goods are carried with other goods (e.g. heavy machinery or crates), all goods shall be securely fixed or packed so as to prevent the release of dangerous goods. Movement of packages may also be prevented by filling any voids by the use of dunnage or by blocking and bracing. Where restraints such as banding or straps are used, these shall not be overtightened to cause damage or deformation of the package.
- 7.1.4.14.1.2 Packages shall not be stacked unless designed for that purpose. Where different design types of packages that have been designed for stacking are to be loaded together, consideration shall be given to their compatibility for stacking with each other. Where necessary, stacked packages shall be prevented from damaging the package below by the use of load-bearing devices.
- 7.1.4.14.1.3 During loading and unloading, packages containing dangerous goods shall be protected from being damaged.
- NOTE: Particular attention shall be paid to the handling of packages during their preparation for carriage, the type of vessel on which they are to be carried and to the method of loading or unloading, so that accidental damage is not caused through dragging or mishandling the packages.*
- 7.1.4.14.1.4 When orientation arrows are required, packages shall be oriented in accordance with such markings.

NOTE: Liquid dangerous goods shall be loaded below dry dangerous goods whenever practicable.

7.1.4.14.2 Dangerous goods shall be stowed at a distance of not less than 1 m from the accommodation, the engine rooms, the wheelhouse and any sources of heat.

When the accommodation or wheelhouse is situated above a hold, dangerous goods shall in no case be stowed beneath such accommodation or wheelhouse.

7.1.4.14.3 Packages shall be protected against heat, sunlight and the effects of the weather. This provision does not apply to vehicles, wagons, tank-containers, portable tanks, MEGCs and containers.

Where packages are not enclosed in vehicles, wagons or containers but loaded on deck, they shall be covered with tarpaulins that are not readily flammable.

The ventilation shall not be obstructed.

7.1.4.14.4 The dangerous goods shall be stowed in the holds. However, dangerous goods packed or loaded in:

- containers having complete sprayproof walls;
- MEGCs;
- vehicles having complete sprayproof walls;
- tank-containers or portable tanks;
- tank vehicles or tank wagons;

may be carried on deck in the protected area.

7.1.4.14.5 Packages containing dangerous goods of Classes 3, 4.1, 4.2, 5.1 or 8 may be stowed on deck in the protected area provided that drums are used or that they are contained in containers with complete walls or vehicles or wagons with complete walls. Substances of Class 2 may be stowed on deck in the protected area, provided they are contained in cylinders.

7.1.4.14.6 For seagoing vessels, the stowage requirements set out in 7.1.4.14.1 to 7.1.4.14.5 above and 7.1.4.14.7 below shall be deemed to have been met, if the relevant stowage provisions of the IMDG Code and, in the case of carriage of dangerous goods in bulk, those set out in subsection 9.3 of the BC Code have been complied with.

7.1.4.14.7 *Handling and stowage of radioactive material*

NOTE 1: “Critical group” means a group of members of the public which is reasonably homogeneous with respect to its exposure for a given radiation source and given exposure pathway and is typical of individuals receiving the highest effective dose by the given exposure pathway from the given source.

NOTE 2: “Members of the public” means in a general sense, any individuals in the population except when subject to occupational or medical exposure.

NOTE 3: “Workers” are any persons who work, whether full time, part-time or temporarily, for an employer and who have recognized rights and duties in relation to occupational radiation protection.

7.1.4.14.7.1 *Segregation*

7.1.4.14.7.1.1 Packages, overpacks, containers, tanks and vehicles and wagons containing radioactive material and unpackaged radioactive material shall be segregated during carriage:

- (a) from workers in regularly occupied working areas;
- (i) in accordance with Table A below; or
- (ii) by distances calculated using a dose criterion of 5 mSv in a year and conservative model parameters;

NOTE: Workers subject to individual monitoring for the purposes of radiation protection shall not be considered for the purposes of segregation.

- (b) from members of the critical group of the public, in areas where the public has regular access;
- (i) in accordance with Table A below; or
- (ii) by distances calculated using a dose criterion of 1 mSv in a year and conservative model parameters;
- (c) from undeveloped photographic film and mailbags;
- (i) in accordance with Table B below; or
- (ii) by distances calculated using a radiation exposure criterion for undeveloped photographic film due to the transport of radioactive material for 0.1 mSv per consignment of such film; and

NOTE: Mailbags shall be assumed to contain undeveloped film and plates and therefore be separated from radioactive material in the same way.

- (d) from other dangerous goods in accordance with 7.1.4.3.

Table A: Minimum distances between packages of category II-YELLOW or of category III-YELLOW and persons

Sum of transport indexes not more than	Exposure time per year (hours)			
	Areas where members of the public have regular access		Regularly occupied working areas	
	50	250	50	250
Segregation distance in metres, no shielding material intervening, from:				
2	1	3	0.5	1
4	1.5	4	0.5	1.5
8	2.5	6	1.0	2.5
12	3	7.5	1.0	3
20	4	9.5	1.5	4
30	5	12	2	5
40	5.5	13.5	2.5	5.6
50	6.5	15.5	3	6.5

Table B: Minimum distances between packages of category II-YELLOW or of category III-YELLOW and packages bearing the word “FOTO”, or mailbags

Total number of packages not more than		Sum of transport indexes not more than	Journey or storage duration, in hours								
Category			1	2	4	10	24	48	120	240	
III-yellow	II-yellow		Minimum distances in metres								
		0.2	0.5	0.5	0.5	0.5	1	1	2	3	
		0.5	0.5	0.5	0.5	1	1	2	3	5	
	1	1	0.5	0.5	1	1	2	3	5	7	
	2	2	0.5	1	1	1.5	3	4	7	9	
	4	4	1	1	1.5	3	4	6	9	13	
	8	8	1	1.5	2	4	6	8	13	18	
1	10	10	1	2	3	4	7	9	14	20	
2	20	20	1.5	3	4	6	9	13	20	30	
3	30	30	2	3	5	7	11	16	25	35	
4	40	40	3	4	5	8	13	18	30	40	
5	50	50	3	4	6	9	14	20	32	45	

7.1.4.14.7.1.2 Category II-YELLOW or III-YELLOW packages or overpacks shall not be carried in compartments occupied by passengers, except those exclusively reserved for couriers specially authorized to accompany such packages or overpacks.

7.1.4.14.7.1.3 No persons other than the master of the vessel or the driver of the vehicle embarked and the other members of the crew shall be permitted in vessels carrying packages, overpacks or containers bearing category II-YELLOW or III-YELLOW labels.

7.1.4.14.7.2 *Activity limits*

The total activity in a single hold or compartment of vessel, or in another conveyance, for carriage of LSA material or SCO articles in Type IP-1, Type IP-2, Type IP-3 or unpackaged, shall not exceed the limits shown in Table C below:

Table C: Conveyance activity limits for LSA material and SCO in industrial packages or unpackaged

Nature of material or articles	Activity limit for conveyances other than by vessel	Activity limit for a hold or compartment of vessel
LSA-I	No limit	No limit
LSA-II and LSA-III non-combustible solids	No limit	100A ₂
LSA-II and LSA-III combustible solids, and all liquids and gases	100A ₂	10A ₂
SCO	100A ₂	10A ₂

7.1.4.14.7.3 *Stowage during carriage and storage in transit*

7.1.4.14.7.3.1 Consignments shall be securely stowed.

- 7.1.4.14.7.3.2 Provided that its average surface heat flux does not exceed $15\text{W}/\text{M}^2$ and that the immediately surrounding cargo is not in bags, a package or overpack may be carried or stored among packaged general cargo without any special stowage provisions except as may be specifically required by the competent authority in an applicable approval certificate.
- 7.1.4.14.7.3.3 Loading of containers and accumulation of packages, overpacks and containers shall be controlled as follows:
- (a) Except under the conditions of exclusive use, and for consignments of LSA-I material, the total number of packages, overpacks and containers aboard a single conveyance shall be so limited that the total sum of the transport indexes aboard the conveyance does not exceed the values shown in Table D below;
 - (b) The radiation level under routine conditions of carriage shall not exceed $2\text{ mSv}/\text{h}$ at any point on, and $0.1\text{ mSv}/\text{h}$ at 2 m from, the external surface of the conveyance, except for consignments carried under exclusive use, for which the radiation limits around the conveyance are set forth in 7.1.4.14.7.3.5 (b) and (c);
 - (c) The total sum of the criticality safety indexes in a container and aboard a conveyance shall not exceed the values shown in Table E below.

Table D: Transport Index limits for containers and conveyances not under exclusive use

Type of container or conveyance	Limit on total sum of transport indexes in a container or aboard a conveyance
Small container	50
Large container	50
Vehicle or wagon	50
Vessel	50

Table E: Criticality Safety Index for containers and vehicles containing fissile material

Type of container or conveyance	Limit on total sum of criticality safety indexes	
	Not under exclusive use	Under exclusive use
Small container	50	n.a.
Large container	50	100
Vehicle or wagon	50	100
Vessel	50	100

- 7.1.4.14.7.3.4 Any package or overpack having either a transport index greater than 10, or any consignment having a criticality safety index greater than 50, shall be carried only under exclusive use.
- 7.1.4.14.7.3.5 For consignments under exclusive use in vehicles or wagons, the radiation level shall not exceed:
- (a) $10\text{ mSv}/\text{h}$ at any point on the external surface of any package or overpack, and may only exceed $2\text{ mSv}/\text{h}$ provided that:
 - (i) the vehicle or wagon is equipped with an enclosure which, during routine conditions of carriage, prevents the access of unauthorized persons to the interior of the enclosure;

- (ii) provisions are made to secure the package or overpack so that its position within the vehicle or wagon enclosure remains fixed during routine conditions of carriage; and
 - (iii) there is no loading or unloading during the shipment;
- (b) 2 mSv/h at any point on the outer surfaces of the vehicle or wagon, including the upper and lower surfaces, or, in the case of an open vehicle or wagon, at any point on the vertical planes projected from the outer edges of the vehicle or wagon, on the upper surface of the load, and on the lower external surface of the vehicle or wagon; and
- (c) 0.1 mSv/h at any point 2 m from the vertical planes represented by the outer lateral surfaces of the vehicle or wagon, or, if the load is carried in an open vehicle or wagon, at any point 2 m from the vertical planes projected from the outer edges of the vehicle or wagon.

7.1.4.14.7.3.6 Packages or overpacks having a surface radiation area greater than 2 mSv/h, unless being carried in or on a vehicle or wagon under exclusive use and unless they are removed from the vehicle or wagon when on board the vessel shall not be transported by vessel except under special arrangement.

7.1.4.14.7.3.7 The transport of consignments by means of a special use vessel which, by virtue of its design, or by reason of its being chartered, is dedicated to the purpose of carrying radioactive material, shall be excepted from the requirements specified in 7.1.4.14.7.3.3 provided that the following conditions are met:

- (a) A radiation protection programme for the shipment shall be approved by the competent authority of the flag state of the vessel and, when requested, by the competent authority at each port of call of the transit countries;
- (b) Stowage arrangements shall be predetermined for the whole voyage including any consignments to be loaded at ports of call en route; and
- (c) The loading, carriage and unloading of the consignments shall be supervised by persons qualified in the transport of radioactive material.

7.1.4.14.7.4 *Segregation of packages containing fissile material during carriage and storage in transit*

7.1.4.14.7.4.1 Any group of packages, overpacks, and containers containing fissile material stored in transit in any one storage area shall be so limited that the total sum of the criticality safety indexes in the group does not exceed 50. Each group shall be stored so as to maintain a spacing of at least 6 m from other such groups.

7.1.4.14.7.4.2 Where the total sum of the criticality safety indexes on board a vehicle, a wagon or in a container exceeds 50, as permitted in Table E above, storage shall be such as to maintain a spacing of at least 6 m from other groups of packages, overpacks or containers containing fissile material or other vehicles or wagons carrying radioactive material. The space between such groups may be used for other dangerous goods of ADN. The carriage of other goods with consignments under exclusive use is permitted provided that the pertinent provisions have been taken by the consignor and that carriage is not prohibited under other requirements.

7.1.4.14.7.5 *Damaged or leaking packages, contaminated packagings*

7.1.4.14.7.5.1 If it is evident that a package is damaged or leaking, or if it is suspected that the package may have leaked or been damaged, access to the package shall be restricted and a qualified person shall, as soon as possible, assess the extent of contamination and the resultant radiation level of the package. The scope of the assessment shall include the package, the vehicle, the wagon, the adjacent loading and unloading areas, and, if necessary, all other material which has been carried in the vessel. When necessary, additional steps for the protection of persons property and the environment, in accordance with provisions established by the competent authority, shall be taken to overcome and minimize the consequences of such leakage or damage.

7.1.4.14.7.5.2 Packages damaged or leaking radioactive contents in excess of allowable limits for normal conditions of carriage may be removed to an acceptable interim location under supervision, but shall not be forwarded until repaired or reconditioned and decontaminated.

7.1.4.14.7.5.3 Vehicles, wagons, vessels and equipment used regularly for the carriage of radioactive material shall be periodically checked to determine the level of contamination. The frequency of such checks shall be related to the likelihood of contamination and the extent to which radioactive material is carried.

7.1.4.14.7.5.4 Except as provided in paragraph 7.1.4.14.7.5.6, any vessel, or equipment or part thereof which has become contaminated above the limits specified in 7.1.4.14.7.5.5 in the course of carriage of radioactive material, or which shows a radiation level in excess of 5 $\mu\text{Sv/h}$ at the surface, shall be decontaminated as soon as possible by a qualified person and shall not be re-used unless the non-fixed contamination does not exceed the limits specified in 7.1.4.14.7.5.5, and the radiation level resulting from the fixed contamination on surfaces after decontamination is less than 5 $\mu\text{Sv/h}$ at the surface.

7.1.4.14.7.5.5 For the purposes of 7.1.4.14.7.5.4, non-fixed contamination shall not exceed:

- 4 Bq/cm^2 for beta and gamma emitters and low toxicity alpha emitters;
- 0.4 Bq/cm^2 for all other alpha emitters.

These are average limits applicable to any area of 300 cm^2 on any part of the surface.

7.1.4.14.7.5.6 Vessels dedicated to the carriage of radioactive material under exclusive use shall be excepted from the requirements of the previous paragraph 7.1.4.14.7.5.4 solely with regard to its internal surfaces and only for as long as it remains under that specific exclusive use.

7.1.4.14.7.6 *Limitation of the effect of temperature*

7.1.4.14.7.6.1 If the temperature of the accessible outer surfaces of a Type B (U) or Type B (M) package could exceed 50° C in the shade, carriage is permitted only under exclusive use. As far as practicable, the surface temperature shall be limited to 85° C. Account may be taken of barriers or screens intended to give protection to transport workers without the barriers or screens being subject to any test.

7.1.4.14.7.6.2 If the average heat flux from the external surfaces of a Type B (U) or B (M) package could exceed 15 W/m^2 , the special stowage requirements specified in the competent authority package design approval certificate shall be met.

7.1.4.14.7.7 *Other provisions*

If neither the consignor nor the consignee can be identified or if the consignment cannot be delivered to the consignee and the carrier has no instructions from the consignor the consignment shall be placed in a safe location and the competent authority shall be informed as soon as possible and a request made for instructions on further action.

7.1.4.15 *Measures to be taken after unloading*

7.1.4.15.1 After unloading the holds shall be inspected and cleaned if necessary. In the case of carriage in bulk, this requirement does not apply if the new cargo comprises the same goods as the previous cargo.

7.1.4.15.2 For material of Class 7 see also 7.1.4.14.7.5.

7.1.4.15.3 A cargo transport unit or hold space which has been used to carry infectious substances shall be inspected for release of the substance before re-use. If the infectious substances were released during carriage, the cargo transport unit or hold space shall be decontaminated before it is re-used. Decontamination may be achieved by any means which effectively inactivates the released infectious substance.

7.1.4.16 *Measures to be taken during loading, carriage, unloading and handling of the cargo*

The filling or emptying of receptacles, tank vehicles, tank wagons, intermediate bulk containers (IBCs), large packagings, MEGCs, portable tanks or tank-containers on board the vessel is prohibited without special permission from the competent authority.

7.1.4.17-
7.1.4.40-
(Reserved)

7.1.4.41 *Fire and naked light*

The use of fire or naked light is prohibited while substances or articles of Divisions 1.1, 1.2, 1.3, 1.5 or 1.6 of Class 1 are on board and the holds are open or the goods to be loaded are located at a distance of less than 50 m from the vessel.

7.1.4.42-
7.1.4.50
(Reserved)

7.1.4.51 *Electrical equipment*

The use of radiotelephone or radar transmitters is not permitted, while substances or articles of Divisions 1.1, 1.2, 1.3, 1.5 or 1.6 of Class 1 are being loaded or unloaded.

This shall not apply to VHF-transmitters of the vessel, in cranes or in the vicinity of the vessel, provided the power of the VHF-transmitter does not exceed 25 W and no part of its aerial is located at a distance less than 2.00 m from the substances or articles mentioned above.

7.1.4.52
(Reserved)

7.1.4.53 *Lighting*

If loading, or unloading is performed at night or in conditions of poor visibility, effective lighting shall be provided.

If provided from the deck, it shall be effected by properly secured electric lamps which shall be positioned in such a way that they cannot be damaged.

Where these lamps are positioned on deck in the protected area, they shall be of “limited explosion risk” type.

7.1.4.54-
7.1.4.74

(Reserved)

7.1.4.75 *Risk of sparking*

All electrically continuous connections between the vessel and the shore as well as appliances used in the protected area shall be so designed that they do not present a source of ignition.

7.1.4.76 *Synthetic ropes*

During loading or unloading operations, the vessel may be moored by means of synthetic ropes only when steel cables are used to prevent the vessel from going adrift.

Steel cables sheathed in synthetic material or natural fibres are considered as equivalent when the minimum tensile strength required in accordance with the Regulations referred to in 1.1.4.6 is obtained from the steel strands.

However, during loading or unloading of containers, vessels may be moored by means of synthetic ropes.

7.1.4.77-
7.1.4.99

(Reserved)

7.1.5 **Additional requirements concerning the operation of vessels**

7.1.5.0 *Marking*

7.1.5.0.1 Vessels carrying dangerous goods listed in Table A of Chapter 3.2 shall, in accordance with Chapter 3 of the European Code for Inland Waterways (CEVNI), display the markings prescribed in column (12) in this table.

7.1.5.0.2 Vessels carrying the dangerous goods listed in Table A of Chapter 3.2 in packages placed exclusively in containers shall display the number of blue cones or blue lights indicated in column (12) of Table A of Chapter 3.2 where:

- three blue cones or three blue lights are required, or
- two blue cones or two blue lights are required, a substance of Class 2 is involved or packing group I is indicated in column (4) of Table A of Chapter 3.2 and the total gross mass of these dangerous goods exceeds 30,000 kg, or
- one blue cone or one blue light is required, a substance of Class 2 is involved or packing group I is indicated in column (4) of Table A of Chapter 3.2 and the total gross mass of these dangerous goods exceeds 130,000 kg.

7.1.5.0.3 Vessels carrying empty, uncleaned tanks, battery vehicles, battery wagons or MEGCs shall display the marking referred to in column (12) of Table A of Chapter 3.2 if these cargo transport units have contained dangerous goods for which this table prescribes marking.

- 7.1.5.0.4 Where more than one marking could apply to a vessel, only the marking which includes the greatest number of blue cones or blue lights shall apply, i.e. in the following order of precedence:
- three blue cones or three blue lights; or
 - two blue cones or two blue lights; or
 - one blue cone or one blue light.
- 7.1.5.0.5 By derogation from paragraph 7.1.5.0.1, and in accordance with the footnotes to article 3.14 of the European Code for Inland Waterways (CEVNI), the competent authority of a Contracting Party may authorize seagoing vessels temporarily operating in an inland navigation area on the territory of this Contracting Party, the use of the day and night signals prescribed in the Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas adopted by the Maritime Safety Committee of the International Maritime Organization (by night an all-round fixed red light and by day flag “B” of the International Code of Signals), instead of the signals prescribed in 7.1.5.0.1. Contracting Parties which have taken the initiative with respect to the derogation granted shall notify the Executive Secretary of the UNECE, who shall bring this derogation to the attention of the Administrative Committee.
- 7.1.5.1 *Mode of navigation***
- 7.1.5.1.1 The competent authorities may impose restrictions on the inclusion of vessels carrying dangerous goods in pushed convoys of large dimension.
- 7.1.5.1.2 When vessels carry substances or articles of Class 1, or substances of Classes 4.1 or 5.2 for which marking with three blue cones or three blue lights is prescribed in column (12) of Table A of Chapter 3.2, or material of Class 7 of UN Nos. 2912, 2913, 2915, 2916, 2917, 2919, 2977, 2978 or 3321 to 3333, the competent authority may impose restrictions on the dimensions of convoys or side-by-side formations. Nevertheless, the use of a motorized vessel giving temporary towing assistance is permitted.
- 7.1.5.2 *Vessels under way***
- Vessels carrying substances or articles of Class 1, or substances of Classes 4.1 or 5.2 for which marking with three blue cones or three blue lights is prescribed in column (12) of Table A of Chapter 3.2, when under way shall keep not less than 50 m away from any other vessel, if possible.
- 7.1.5.3 *Mooring***
- Vessels shall be moored securely, but in such a way that they can be released quickly in an emergency.
- 7.1.5.4 *Berthing***
- 7.1.5.4.1 The distances to be kept by vessels carrying dangerous goods at berth from other vessels shall not be less than the distance prescribed by the European Code for Inland Waterways (CEVNI).
- 7.1.5.4.2 An expert in accordance with 8.2.1.2 shall be permanently on board berthed vessels for which marking is prescribed in column (12) of Table A of Chapter 3.2.

The competent authority may, however, exempt from this obligation those vessels which are berthed in a harbour basin or in an accepted berthing position.

7.1.5.4.3 Outside the berthing areas specifically designated by the competent authority, the distances to be kept by berthed vessels shall not be less than:

- 100 m from residential areas, civil engineering structures or storage tanks, if the vessel is required to be marked with one blue cone or one blue light in accordance with the requirements of column (12) of Table A of Chapter 3.2;
- 100 m from civil engineering structures and storage tanks and 300 m from residential areas if the vessel is required to be marked with two blue cones or two blue lights in accordance with the requirements of column (12) of Table A of Chapter 3.2;
- 500 m from residential areas, civil engineering structures and storage tanks holding gas or flammable liquids if the vessel is required to be marked with three blue cones or three blue lights in accordance with the requirements of column (12) of Table A of Chapter 3.2.

While waiting in front of locks or bridges, vessels are allowed to keep distances different from and lower than those given above. In no case shall the distance be less than 100 m.

7.1.5.4.4 The competent authority may prescribe distances lower than those given in 7.1.5.4.3 above, especially taking local conditions into account.

7.1.5.5 *Stopping of vessels*

If navigation of a vessel carrying substances and articles of Class 1 or substances of Class 4.1 or 5.2 for which marking with three blue cones or three blue lights is prescribed in column (12) of Table A of Chapter 3.2 threatens to become dangerous owing either to:

- external factors (bad weather, unfavourable conditions of the waterway, etc.), or
- the condition of the vessel itself (accident or incident),

the vessel shall be stopped at a suitable berthing area as far away as possible from residential areas, harbours, civil engineering structures or storage tanks for gas or flammable liquids, regardless of the provisions set out in 7.1.5.4.

The competent authority shall be notified without delay.

7.1.5.6-
7.1.5.7 *(Reserved.*

7.1.5.8 *Reporting duty*

7.1.5.8.1 In the States where the reporting duty is in force, the master of a vessel for which marking in accordance with 7.1.5.0 is required shall, prior to the start of any voyage, report the following particulars to the competent authority of the State in which the voyage has started:

- name of the vessel;
- official number;
- dead-weight tonnage;

- description of the dangerous goods carried as given in the transport document (information according to 5.4.1.1.1 (a) to (d)) together with the quantity in each case;

NOTE: The gross mass of the packages containing substances or articles of Class 1 shall be declared in addition to the net mass of explosive substances and of explosive substances contained in the articles.

- number of persons on board;
- port of destination; and
- planned shipping route.

This reporting duty shall apply in each State territory once to both passages upstream and downstream so far as the competent authorities so require. The information may be given orally (e.g. by radio-telephone, where appropriate by automatic wireless message service) or in writing.

7.1.5.8.2 When passing the other traffic control stations designated by the competent authority, the following particulars shall be reported:

- name of the vessel;
- official number;
- dead-weight tonnage.

7.1.5.8.3 Changes to any of the particulars referred to in 7.1.5.8.1 shall be reported to the competent authority without delay.

7.1.5.8.4 The information is confidential and shall not be passed on to third parties by the competent authority.

The competent authority may, however, in the event of an accident, inform the emergency services of the relevant particulars required for organizing emergency action.

7.1.5.9-
7.1.5.99 *(Reserved)*

7.1.6 **Additional requirements**

7.1.6.1-
7.1.6.10 *(Reserved)*

7.1.6.11 **Carriage in bulk**

The following additional requirements shall be met when they are indicated in column (11) of Table A of Chapter 3.2:

CO01: The surfaces of holds shall be coated or lined such that they are not readily flammable and not liable to impregnation by the cargo.

CO02: Any part of the holds and of the hatchway covers which may come into contact with this substance shall consist of metal or of wood having a specific density of not less than 0.75 kg/dm³ (seasoned wood).

- CO03: The inner surfaces of holds shall be lined or coated so as to prevent corrosion.
- ST01: The substances shall have been stabilized in accordance with the requirements applicable to ammonium nitrate fertilizers set out in the BC Code. Stabilizing shall be certified by the consignor in the transport document.
- In those States where this is required, these substances may be carried in bulk only with the approval of the competent authority.
- ST02: These substances may be carried in bulk if the results of the trough test according to Appendix D.4 of the BC Code show that the self-sustaining decomposition rate is not greater than 25 cm/h.
- RA01: The materials may be carried in bulk provided that:
- for materials other than natural ores, carriage is under exclusive use and there is no escape of contents out of the vessel and no loss of shielding under normal conditions of transport; or
 - for natural ores, carriage is under exclusive use.
- RA02: The materials may be carried in bulk provided that:
- they are carried in a vessel so that, under normal conditions of transport, there is no escape of contents or loss of shielding;
 - they are carried under exclusive use if the contamination on the accessible and inaccessible surfaces is greater than 4 Bq/cm^2 (10^{-4} Ci/cm^2) for beta and gamma emitters and low toxicity alpha emitters or 0.4 Bq/cm^2 ($10^{-5} \text{ } \mu\text{Ci/cm}^2$) for all other alpha emitters;
 - measures are taken to ensure that radioactive material is not released into the vessel, if it is suspected that non-fixed contamination exists on inaccessible surfaces of more than 4 Bq/cm^2 ($10^{-4} \text{ } \mu\text{Ci/cm}^2$) for beta and gamma emitters and low toxicity alpha emitters or 0.4 Bq/cm^2 ($10^{-5} \text{ } \mu\text{Ci/cm}^2$) for all other alpha emitters.
- RA03: Surface Contaminated Objects (SCO-II) shall not be carried in bulk.

7.1.6.12

Ventilation

The following additional requirements shall be met when they are indicated in column (10) of Table A of Chapter 3.2:

- VE01: Holds containing these substances shall be ventilated with the ventilators operating at full power, where after measurement it has been established that the concentration of gases given off by the cargo exceeds 10% of the lower explosive limit. The measurement shall be carried out immediately after loading. The measurement shall be repeated after one hour for monitoring purposes. The results of the measurement shall be recorded in writing.
- VE02: Holds containing these substances shall be ventilated with the ventilators operating at full power, where after measurement it has been established that the holds are not free from gases given off by the cargo. The measurement shall be carried out

immediately after loading. The measurement shall be repeated after one hour for monitoring purposes. The results of the measurement shall be recorded in writing.

VE03: Spaces such as holds, accommodation and engine rooms, adjacent to holds containing these substances shall be ventilated.

After unloading, holds having contained these substances shall undergo forced ventilation.

After ventilation, the concentration of gases in these holds shall be measured.

The results of the measurement shall be recorded in writing.

VE04 When aerosols are carried for the purposes of reprocessing or disposal under special provision 327 of chapter 3.3, provisions of VE01 and VE02 are applied.

7.1.6.13 *Measures to be taken before loading*

The following additional requirements shall be met when they are indicated in column (11) of Table A of Chapter 3.2:

LO01: Before these substances or articles are loaded, it shall be ensured that there are no metal objects in the hold which are not an integral part of the vessel.

LO02: These substances may be loaded in bulk only if their temperature is not above 55° C.

LO03: Before loading these substances in bulk or unpackaged, holds should be made as dry as possible.

LO04: Any loose organic material shall be removed from holds before loading these substances in bulk.

LO05: Prior to carriage of pressure receptacles it shall be ensured that the pressure has not risen due to potential hydrogen generation.

7.1.6.14 *Handling and stowage of cargo*

The following additional requirements shall be met when they are indicated in column (11) of Table A of Chapter 3.2:

HA01: These substances or articles shall be stowed at a distance of not less than 3.00 m from the accommodation, engine rooms, the wheelhouse and from any sources of heat.

HA02: These substances or articles shall be stowed at a distance of not less than 2.00 m from the vertical planes defined by the sides of the vessel.

HA03: Any friction, impact, jolting, overturning or dropping shall be prevented during handling of these substances or articles.

All packages loaded in the same hold shall be stowed and wedged as to prevent any jolting or friction during carriage.

HA04: Stacking of non-dangerous goods on top of packages containing these substances or articles is prohibited.

HA05: Where these substances or articles are loaded together with other goods in the same hold, these substances or articles shall be loaded after, and unloaded before, all the other goods.

This provision does not apply if the substances or articles of Class 1 are contained in containers.

HA06: While these substances or articles are being loaded or unloaded, no loading or unloading operations shall take place in the other holds and no filling or emptying of fuel tanks shall be allowed. The competent authority may, however, permit exemptions from this provision.

HA07: It is prohibited to load or unload these substances in bulk or unpackaged if there is a danger that they may get wet because of the prevailing weather conditions.

HA08: If the packages with these substances are not contained in a container, they shall be placed on gratings and covered with waterproof tarpaulins arranged in such a way that the water drains off to the outside and the air circulation is not hindered.

HA09: If these substances are carried in bulk they shall not be loaded in the same hold together with flammable substances.

HA10: These substances shall be stowed on deck in the protected area. For seagoing vessels, the stowage requirements are deemed to be met if the provisions of the IMDG Code are complied with.

7.1.6.15 *(Reserved)*

7.1.6.16 *Measures to be taken during loading, carriage, unloading and handling of cargo*

The following additional requirements shall be met when they are indicated in column (11) of Table A of Chapter 3.2:

IN01: After loading and unloading of these substances in bulk or unpackaged and before leaving the cargo transfer site, the concentration of gases in the accommodation, engine rooms and adjacent holds shall be measured by the consignor or consignee using a flammable gas detector.

Before any person enters a hold and prior to unloading, the concentration of gases shall be measured by the consignee of the cargo.

The hold shall not be entered or unloading started until the concentration of gases in the airspace above the cargo is below 50% of the lower explosive limit.

If significant concentrations of gases are found in these spaces, the necessary safety measures shall be taken immediately by the consignor or the consignee.

IN02: If a hold contains these substances in bulk or unpackaged, the gas concentration shall be measured in all other spaces of the vessel which are used by the crew at least once every eight hours with a toximeter. The results of the measurements shall be recorded in writing.

IN03: If a hold contains these substances in bulk or unpackaged, the master shall make sure every day by checking the hold bilge wells or pump ducts that no water has entered the hold bilges.

Water which has entered the hold bilges shall be removed immediately.

7.1.6.17- *(Reserved)*
7.1.9.99

CHAPTER 7.2**TANK VESSELS****7.2.0 General requirements**

7.2.0.1 The provisions of 7.2.0 to 7.2.5 are applicable to tank vessels.

7.2.0.2-
7.2.0.99 *(Reserved)*

7.2.1 Mode of carriage of goods

7.2.1.1-
7.2.1.20 *(Reserved)*

7.2.1.21 Carriage in cargo tanks

7.2.1.21.1 Substances, their assignment to the various types of tank vessels and the special conditions for their carriage in these tank vessels, are listed in Table C of Chapter 3.2.

7.2.1.21.2 Substances, which according to column (6) of Table C of Chapter 3.2, have to be carried in a tank vessel of type N, open, may also be carried in a tank vessel of type N, open, with flame-arresters; type N, closed; types C or G provided that all conditions of carriage prescribed for tank vessels of type N, open, as well as all other conditions of carriage required for these substances in Table C of Chapter 3.2 are met.

7.2.1.21.3 Substances which, according to column (6) of Table C of Chapter 3.2 have to be carried in a tank vessel of type N, open, with flame-arresters, may also be carried in tank vessels of type N, closed, and types C or G provided that all conditions of carriage prescribed for tank vessels of type N, open, with flame arresters, as well as all other conditions of carriage required for these substances in Table C of Chapter 3.2 are met.

7.2.1.21.4 Substances which, according to column (6) of Table C of Chapter 3.2 have to be carried in a tank vessel of type N, closed, may also be carried in tank vessels of type C or G provided that all conditions of carriage prescribed for tank vessels of type N, closed, as well as all other conditions of carriage required for these substances in Table C of Chapter 3.2 are met.

7.2.1.21.5 Substances which, according to column (6) of Table C of Chapter 3.2 have to be carried in tank vessels of type C may also be carried in tank vessels of type G provided that all conditions of carriage prescribed for tank vessels of type C as well as all other conditions of carriage required for these substances in Table C of Chapter 3.2 are met.

7.2.1.21.6 Oily and greasy wastes resulting from the operation of the vessel may only be carried in fire-resistant receptacles, fitted with a lid, or in cargo tanks.

7.2.1.22-
7.2.1.99 *(Reserved)*

7.2.2 Requirements applicable to vessels**7.2.2.0 Permitted vessels**

NOTE 1: The relief pressure of the safety valves or of the high-velocity vent valves shall be indicated in the certificate of approval (see 8.6.1.3).

NOTE 2: The design pressure and the test pressure of cargo tanks shall be indicated in the certificate of the recognised classification society prescribed in 9.3.1.8.1 or 9.3.2.8.1 or 9.3.3.8.1.

NOTE 3: Where a vessel carries cargo tanks with different valve-relief pressures, the relief pressure of each tank shall be indicated in the certificate of approval and the design and test pressures of each tank shall be indicated in the certificate of the recognised classification society.

7.2.2.0.1 Dangerous substances may be carried in tank vessels of Types G, C or N in accordance with the requirements of sections 9.3.1, 9.3.2 or 9.3.3 respectively.

NOTE: The substances accepted for carriage in the vessel are indicated in the certificate to be drawn up by the recognised classification society (see 1.16.1.2.5).

7.2.2.1-
7.2.2.4 (Reserved)

7.2.2.5 Instructions for the use of devices and installations

Where specific safety rules have to be complied with when using any device or installation, instructions for the use of the particular device or installation shall be readily available for consultation at appropriate places on board in the language normally spoken on board, and also, if that language is not English, French or German, in English, French or German unless agreements concluded between the countries concerned in the transport operation provide otherwise.

7.2.2.6 Gas detection system

The sensors of the gas detection system shall be set at not more than 20% of the lower explosive limit of the substances allowed for carriage in the vessel.

The system shall have been approved by the competent authority or a recognized classification society.

7.2.2.7
7.2.2.18 (Reserved)

7.2.2.19 Pushed convoys and side-by-side formations

7.2.2.19.1 Where at least one vessel of a convoy or side-by-side formation is required to be in possession of a certificate of approval for the carriage of dangerous goods, all vessels of such convoy or side-by-side formation shall be provided with an appropriate certificate of approval.

Vessels not carrying dangerous goods shall comply with the provisions of 7.1.2.19.

7.2.2.19.2 For the purposes of the application of this Part, the entire pushed convoy or side-by-side formation shall be deemed to be a single vessel.

7.2.2.19.3 When a pushed convoy or a side-by-side formation comprises a tank vessel carrying dangerous substances, vessels used for propulsion shall meet the requirements of the following paragraphs:

7.2.2.5, 8.1.4, 8.1.5, 8.1.6.1, 8.1.6.3, 8.1.7, 8.1.8, 8.1.9, 9.3.3.0.1, 9.3.3.0.3 (d), 9.3.3.0.5, 9.3.3.10.1, 9.3.3.10.2, 9.3.3.12.4, 9.3.3.12.6, 9.3.3.16, 9.3.3.17.1 to 9.3.3.17.4, 9.3.3.31.1 to 9.3.3.31.5, 9.3.3.32.2, 9.3.3.34.1, 9.3.3.34.2, 9.3.3.40.1 (however, one single fire or ballast pump shall be sufficient), 9.3.3.40.2, 9.3.3.41, 9.3.3.50.1 (c), 9.3.3.50.2, 9.3.3.51, 9.3.3.52.3 to 9.3.3.52.6, 9.3.3.56.5, 9.3.3.71 and 9.3.3.74.

7.2.2.20 *(Reserved)*

7.2.2.21 *Safety and control equipment*

It shall be possible to interrupt loading or unloading of substances of Class 2 and substances assigned to UN Nos. 1280 and 2983 of Class 3 by means of switches installed at two locations on the vessel (fore and aft) and at two locations ashore (directly at the access to the vessel and at an appropriate distance on shore). Interruption of loading and unloading shall be effected by the means of a quick action stop valve which shall be directly fitted to the flexible connecting hose between the vessel and the shore facility.

The system of disconnection shall be designed in accordance with the closed circuit principle.

7.2.2.22 *Cargo tank openings*

When substances for which a type C vessel is required in column (6) of Table C of Chapter 3.2 are carried, the high-velocity vent valves shall be set so that blowing-off does not normally occur while the vessel is under way.

7.2.2.23-
7.2.2.99 *(Reserved)*

7.2.3 *General service requirements*

7.2.3.1 *Access to cargo tanks, residual cargo tanks, cargo pump-rooms below deck, cofferdams, double-hull spaces, double bottoms and hold spaces; inspections*

7.2.3.1.1 The cofferdams shall be empty. They shall be inspected once a day in order to ascertain that they are dry (except for condensation water).

7.2.3.1.2 Access to the cargo tanks, residual cargo tanks, cofferdams, double-hull spaces, double bottoms and hold spaces is not permitted except for carrying out inspections or cleaning operations.

7.2.3.1.3 Access to the double-hull spaces and the double bottoms is not permitted while the vessel is under way.

7.2.3.1.4 When the gas concentration or oxygen content has to be measured before entry into cargo tanks, residual cargo tanks, cargo pump-rooms below deck, cofferdams, double-hull spaces, double bottoms or hold spaces, the results of these measurements shall be recorded in writing.

The measurement may only be effected by persons equipped with breathing apparatus suited to the substance carried.

Entry into these spaces is not permitted for the purpose of measuring.

7.2.3.1.5 Before any person enters cargo tanks, the cargo pump-rooms below deck, cofferdams, double-hull spaces, double bottoms or hold spaces:

- (a) When dangerous substances of Classes 2, 3, 4.1, 6.1, 8 or 9 for which a flammable gas detector is required in column (18) of Table C of Chapter 3.2 are carried on board the vessel, it shall be established, by means of this device that the gas concentration in these cargo tanks, cargo pump-rooms below deck, cofferdams, double-hull spaces, double bottoms or hold spaces is not more than 50% of the lower explosive limit of the cargo. For the cargo pump-rooms below deck this may be determined by means of the permanent gas detection system;
- (b) When dangerous substances of Classes 2, 3, 4.1, 6.1, 8 or 9 for which a toximeter is required in column (18) of Table C of Chapter 3.2 are carried on board the vessel, it shall be established, by means of this device that the cargo tanks, cargo pump-rooms below deck, cofferdams, double-hull spaces, double bottoms or hold spaces do not contain any significant concentration of toxic gases.

7.2.3.1.6 Entry into empty cargo tanks, the cargo pump-rooms below deck, cofferdams, double-hull spaces, double bottoms and hold spaces is not permitted, except where:

- there is no lack of oxygen and no measurable amount of dangerous substances in dangerous concentrations; or
- the person entering the spaces wears a self-contained breathing apparatus and other necessary protective and rescue equipment, and is secured by a line. Entry into these spaces is only permitted if this operation is supervised by a second person for whom the same equipment is readily at hand. Another two persons capable of giving assistance in an emergency shall be on the vessel within calling distance. If a rescue winch has been installed, only one other person is sufficient.

7.2.3.2 *Cargo pump-rooms below deck*

7.2.3.2.1 When carrying dangerous substances of classes 3, 4.1, 6.1, 8 or 9, the cargo pump-rooms below deck shall be inspected daily so as to ascertain that there are no leaks. The bilges and the drip pans shall be kept clean and free from products.

7.2.3.2.2 When the gas detection system is activated, the loading and unloading operations shall be stopped immediately. All shut-off devices shall be closed and the cargo pump-rooms shall be evacuated immediately. All entrances shall be closed. The loading or unloading operations shall not be continued except when the damage has been repaired or the fault eliminated.

7.2.3.3-
7.2.3.5 *(Reserved)*

7.2.3.6 *Gas detection system*

The gas detection system shall be maintained and calibrated in accordance with the instructions of the manufacturer.

7.2.3.7 *Gas-freeing of empty cargo tanks*

7.2.3.7.0 Gas-freeing of empty or unloaded cargo tanks is permitted under the conditions below but only if it is not prohibited on the basis of international or domestic legal requirements.

7.2.3.7.1 Empty or unloaded cargo tanks having previously contained dangerous substances of Class 2 or Class 3, with a classification code including the letter “T” in column (3b) of Table C of Chapter 3.2, Class 6.1 or packing group I of Class 8, may only be gas-freed by either competent persons according to sub-section 8.2.1.2 or companies approved by the competent

authority for that purpose. Gas-freeing may be carried out only at the locations approved by the competent authority.

7.2.3.7.2 Gas-freeing of empty or unloaded cargo tanks having contained dangerous goods other than those referred to under 7.2.3.7.1 above, may be carried out while the vessel is under way by means of suitable venting equipment with the tank lids closed and by leading the gas/air mixtures through flame-arresters capable of withstanding steady burning. In normal conditions of operation, the gas concentration in the vented mixture at the outlet shall be less than 50% of the lower explosive limit. The suitable venting equipment may be used for gas-freeing by extraction only when a flame-arrester is fitted immediately before the ventilation fan on the extraction side. The gas concentration shall be measured once each hour during the two first hours after the beginning of the gas-freeing operation by forced ventilation or by extraction, by an expert referred to in 7.2.3.15. The results of these measurements shall be recorded in writing.

Gas-freeing is, however, prohibited within the area of locks including their lay-bys.

7.2.3.7.3 Where gas-freeing of cargo tanks having previously contained the dangerous goods referred to in 7.2.3.7.1 above is not practicable at the locations designated or approved for this purpose by the competent authority, gas-freeing may be carried out while the vessel is under way, provided that:

- the requirements of 7.2.3.7.2 are complied with; the concentration of dangerous substances in the vented mixture at the outlet shall, however, be not more than 10% of the lower explosive limit;
- there is no risk involved for the crew;
- any entrances or openings of spaces connected to the outside are closed; this provision does not apply to the air supply openings of the engine room and overpressure ventilation systems;
- any member of the crew working on deck is wearing suitable protective equipment;
- it is not carried out within the area of locks including their lay-bys, under bridges or within densely populated areas.

7.2.3.7.4 Gas-freeing operations shall be interrupted during a thunderstorm or when, due to unfavourable wind conditions, dangerous concentrations of gases are to be expected outside the cargo area in front of accommodation, the wheelhouse and service spaces. The critical state is reached as soon as concentrations of more than 20% of the lower explosive limit have been detected in those areas by measurements by means of portable equipment.

7.2.3.7.5 The marking prescribed in column (19) of Table C of Chapter 3.2 may be withdrawn when, after gas-freeing of the cargo tanks, it has been ascertained, using the equipment described in column (18) of Table C of Chapter 3.2, that the cargo tanks no longer contain flammable gases in concentrations of more than 20% of the lower explosive limit or do not contain any significant concentration of toxic gases.

7.2.3.8-
7.2.3.11 (*Reserved*)

7.2.3.12 Ventilation

7.2.3.12.1 While the machinery in the service spaces is operating, the extension ducts connected to the air inlets, if any, shall be in the upright position; otherwise the inlets shall be closed. This

provision does not apply to air inlets of service spaces outside the cargo area, provided the inlets without extension duct are located not less than 0.50 m above the deck.

7.2.3.12.2 The ventilation of pump rooms shall be in operation:

- at least 30 minutes before entry and during occupation;
- during loading, unloading and gas-freeing; and
- after the gas detection system has been activated.

7.2.3.13-
7.2.3.14 *(Reserved)*

7.2.3.15 *Expert on board the vessel*

When dangerous substances are carried, an expert, referred to in 8.2.1 shall be on board the vessel. In addition,

- when dangerous substances are carried, for which a type G tank vessel is prescribed in column (6) of Table C of Chapter 3.2, this expert shall be the expert referred to in 8.2.1.5; and
- when dangerous substances are carried, for which a type C tank vessel is prescribed in column (6) of Table C of Chapter 3.2, this expert shall be the expert referred to in 8.2.1.7.

During the carriage of goods for which a type C vessel is prescribed in column (6) of Table C of Chapter 3.2 and cargo tank type 1 in column (8), an expert referred to in 8.2.1.5 for carriage in type G vessels is sufficient.

7.2.3.16-
7.2.3.19 *(Reserved)*

7.2.3.20 *Water ballast*

7.2.3.20.1 Cofferdams and hold spaces containing insulated cargo tanks shall not be filled with water. Double-hull spaces, double bottoms and hold spaces may be filled with ballast water provided the cargo tanks have been discharged.

If the cargo tanks are not empty, double-hull spaces and double bottoms may be filled with ballast water provided this has been taken into account in the damage-control plan and the ballast tanks are not filled to more than 90% of their capacity and provided this is not prohibited in column (20) of Table C of Chapter 3.2.

7.2.3.20.2 Where ballast water is discharged from cargo tanks, an appropriate entry shall be made in the loading journal.

7.2.3.21 *(Reserved)*

7.2.3.22 *Entrances to hold spaces, cargo pump-rooms below deck and cofferdams, openings of cargo tanks and residual cargo tanks; closing devices*

The cargo tanks, residual cargo tanks and entrances to cargo pump-rooms below deck, cofferdams and hold spaces shall remain closed. This requirement shall not apply to cargo

pump-rooms on board oil separator and supply vessels or to the other exceptions set out in this Part.

7.2.3.23-
7.2.3.24 *(Reserved)*

7.2.3.25 *Connections between pipes*

7.2.3.25.1 Connecting two or more of the following groups of pipes is prohibited:

- (a) pipes for loading and unloading;
- (b) pipes for ballasting and draining cargo tanks, cofferdams, hold spaces, double-hull spaces and double bottoms;
- (c) pipes located outside the cargo area.

7.2.3.25.2 The provision of 7.2.3.25.1 above does not apply to removable pipe connections between cofferdam pipes and

- pipes for loading and unloading;
- pipes located outside the cargo area while the cofferdams have to be filled with water in an emergency.

In these cases the connections shall be designed so as to prevent water from being drawn from the cargo tanks. The cofferdams shall be emptied only by means of ejectors or an independent system within the cargo area.

7.2.3.25.3 The provisions of 7.2.3.25.1 (b) and (c) above do not apply to:

- pipes intended for ballasting and draining double-hull spaces and double bottoms which have not common boundary with the cargo tanks;
- pipes intended for ballasting hold spaces where the pipes of the fire-fighting system within the cargo area are used for this purpose. Double-hull and double bottom spaces and hold spaces shall be stripped only by means of ejectors or an independent system within the cargo area.

7.2.3.26-
7.2.3.27 *(Reserved)*

7.2.3.28 *Refrigeration system*

For the carriage of refrigerated substances, an instruction shall be on board mentioning the permissible maximum loading temperature in relation to the capacity of the refrigeration system and the insulation design of the cargo tanks.

7.2.3.29 *Lifeboats*

7.2.3.29.1 The lifeboat required in accordance with the Regulations referred to in 1.1.4.6 shall be stowed outside the cargo area. The lifeboat may, however, be stowed in the cargo area provided an easily accessible collective life-saving appliance conforming to the Regulations referred to in 1.1.4.6 is available within the accommodation area.

7.2.3.29.2 7.2.3.29.1 above does not apply to oil separator or supply vessels.

7.2.3.30 *(Reserved)*

7.2.3.31 *Engines*

7.2.3.31.1 The use of engines running on fuels having a flash-point below 55° C (e.g. petrol engines) is prohibited. This requirement does not apply to the outboard motors of lifeboats.

7.2.3.31.2 The carriage of power-driven conveyances such as passenger cars and motor boats in the cargo area is prohibited.

7.2.3.32 *Oil fuel tanks*

Double bottoms with a height of at least 0.6 m may be used as oil fuel tanks, provided they have been constructed in accordance with Part 9.

7.2.3.33-
7.2.3.40 *(Reserved)*

7.2.3.41 *Fire and naked light*

7.2.3.41.1 The use of fire or naked light is prohibited.

This provision does not apply to the accommodation and the wheelhouse.

7.2.3.41.2 Heating, cooking and refrigerating appliances shall not be fuelled with liquid fuels, liquid gas or solid fuels.

Cooking and refrigerating appliances may only be used in the accommodation and in the wheelhouse.

7.2.3.41.3 Heating appliances or boilers fuelled with liquid fuels having a flash-point above 55° C which are installed in the engine room or in another suitable space may, however, be used.

7.2.3.42 *Cargo heating system*

7.2.3.42.1 Heating of the cargo is not permitted except where there is risk of solidification of the cargo or where the cargo, because of its viscosity, cannot be unloaded in the usual manner.

In general, a liquid shall not be heated up to a temperature above its flash-point.

Special provisions are included in column 20 of Table C of Chapter 3.2.

7.2.3.42.2 Cargo tanks containing substances which are heated during transport shall be equipped with devices for measuring the temperature of the cargo.

7.2.3.42.3 During unloading, the cargo heating system may be used provided that the space where it has been installed meets in all respects the provisions of 9.3.2.52.3 or 9.3.3.52.3.

7.2.3.42.4 The provisions of 7.2.3.42.3 above do not apply when the cargo heating system is supplied with steam from shore and only the circulation pump is in operation, as well as when the flash-point of the cargo being unloaded is not less than 60° C.

7.2.3.43 *(Reserved)*

7.2.3.44 ***Cleaning operations***

The use of liquids having a flash-point below 55° C for cleaning purposes is permitted only in the cargo area.

7.2.3.45-
7.2.3.50 (*Reserved*)

7.2.3.51 ***Electrical installations***

7.2.3.51.1 The electrical installations shall be properly maintained in a faultless condition.

7.2.3.51.2 The use of movable electric cables is prohibited in the cargo area.

This provision does not apply to:

- intrinsically safe electric circuits;
- electric cables for connecting signal lights or gangway lighting, provided the socket is permanently fitted to the vessel close to the signal mast or gangway;
- electric cables for connecting submerged pumps on board oil separator vessels.

7.2.3.51.3 The sockets for connecting the signal lights and gangway lighting or for submerged pumps on board oil separator vessels shall not be live except when the signal lights or the gangway lighting or the submerged pumps on board oil separator vessels are switched on.

Connecting or disconnecting shall not be possible except when the sockets are not live.

7.2.3.52-
7.2.3.99 (*Reserved*)

7.2.4 **Additional requirements concerning loading, carriage, unloading and other handling of cargo****7.2.4.1** ***Limitation of the quantities carried***

7.2.4.1.1 The carriage of packages in the cargo area is prohibited. This prohibition does not apply to:

- residual cargo, cargo residues and slops in approved intermediate bulk containers (IBCs), tank-containers or portable tanks having a maximum individual capacity of not more than 2.00 m³; not more than six such intermediate bulk containers, tank-containers or portable tanks, however, shall be carried. These intermediate bulk containers, tank-containers or portable tanks shall meet the requirements of international regulations applicable to the substance concerned. They shall be properly secured in the cargo area and comply with the provisions of 9.3.2.26.4 or 9.3.3.26.4 for the reception of residual cargo, cargo residues or slops;
- to cargo samples, up to a maximum of 30, of substances accepted for carriage in the tank vessel, where the maximum contents are 500 ml per receptacle. Receptacles shall meet the packing requirements referred to in Part 4 of ADR and shall be placed on board, at a specific point in the cargo area, such that under normal conditions of carriage they cannot break or be punctured and their contents cannot spill in the hold space. Fragile receptacles shall be suitably padded.

- 7.2.4.1.2 On board oil separator vessel receptacles with a maximum capacity of 2.00 m³ oily and greasy wastes resulting from the operation of vessels may be placed in the cargo area provided that these receptacles are properly secured.
- 7.2.4.1.3 On board supply vessel packages of dangerous goods may be carried in the cargo area up to a gross quantity of 5,000 kg provided that this possibility is mentioned in the certificate of approval. The packages shall be properly secured and shall be protected against heat, sun and bad weather.
- 7.2.4.1.4 On board supply vessels or other vessels delivering products for the operation of vessels, the number of cargo samples referred to in 7.2.4.1.1 may be increased from 30 to a maximum of 500.
- 7.2.4.2 *Reception of oily and greasy wastes resulting from the operation of vessels and delivery of products for the operation of vessels***
- 7.2.4.2.1 The reception of unpackaged liquid oily and greasy wastes resulting from the operation of vessels may only be effected by suction.
- 7.2.4.2.2 The landing and reception of oily and greasy wastes may not take place during the loading and unloading of substances for which protection against explosion is required column (16) of Table C of Chapter 3.2 nor during the gas-freeing of tank vessels. This requirement does not apply to oil separator vessels provided that the provisions for protection against explosion applicable to the dangerous substance are complied with.
- 7.2.4.2.3 Berthing and handing over of products for the operation of vessels shall not take place during the loading or unloading of substances for which protection against explosions is required column (16) of Table C of Chapter 3.2 nor during the gas-freeing of tank vessels. This requirement does not apply to supply vessels provided that the provisions for protection against explosion applicable to the dangerous substance are complied with.
- 7.2.4.2.4 The competent authority may issue derogations to the requirements of 7.2.4.2.1 and 7.2.4.2.2 above. During unloading it may also issue derogations to 7.2.4.2.3 above.
- 7.2.4.3-
7.2.4.6 *(Reserved)*
- 7.2.4.7 *Places of loading and unloading***
- 7.2.4.7.1 Tank vessels shall be loaded, unloaded or gas-freed only at the places designated or approved for this purpose by the competent authority.
- 7.2.4.7.2 The reception of unpackaged oily and greasy liquid wastes resulting from the operation of vessels and the handing over of products for the operation of vessels shall not be taken to be loading or unloading within the meaning of 7.2.4.7.1 above.
- 7.2.4.8 *(Reserved)*
- 7.2.4.9 *Cargo transfer operations***
- Partial or complete cargo transfer without permission from the competent authority is prohibited outside a cargo transfer place approved for this purpose.

7.2.4.10 Checklist

- 7.2.4.10.1 Loading or unloading shall not be started before a check list for the cargo in question has been completed and questions 1 to 18 of the list have been checked off with an "X". Irrelevant questions should be deleted. The list shall be completed in duplicate and signed by the master or a person mandated by himself and the person responsible for the handling at the shore facilities. If a positive response to all the questions is not possible loading or unloading is only permitted with the consent of the competent authority.
- 7.2.4.10.2 The list shall conform to the model in 8.6.3.
- 7.2.4.10.3 The checklist shall be printed at least in languages understood by the master and the person responsible for the handling at the shore facilities.
- 7.2.4.10.4 The provisions of 7.2.4.10.1 to 7.2.4.10.3 above shall not apply to the reception of oily and greasy wastes by oil separator vessels nor to the handing over of products for the operation of vessels by supply vessels.

7.2.4.11 Loading journal; loading plan

- 7.2.4.11.1 The master shall record without delay in a loading journal all activities relating to loading, unloading, cleaning, gas-freeing, discharge of washing water and reception or discharge of ballast water (in cargo tanks). The goods shall be described as in the transport document (information according to 5.4.1.1.2 (a) to (d)).
NOTE: It is not necessary to apply this paragraph. The date of application will be defined later.
- 7.2.4.11.2 The master shall enter on a cargo stowage plan the goods carried in the individual cargo tanks. The goods shall be described as in the transport document (information according to 5.4.1.1.2 (a) to (d)).

7.2.4.12 Registration during the voyage

The following particulars shall immediately be entered in the register referred to in 8.1.11:

Loading: Place of loading and loading berth, date and time, UN number or identification number of the substance, proper shipping name of the substance, the class and packing group if any;

Unloading: Place of unloading and unloading berth, date and time;

Gas-freeing of UN No. 1203 petrol: Gas-freeing place and facility or sector, date and time.

These particulars shall be provided for each cargo tank.

7.2.4.13 Measures to be taken before loading

- 7.2.4.13.1 When residues of the previous cargo may cause dangerous reactions with the next cargo, any such residues shall be properly removed.
- Substances which react dangerously with other dangerous goods shall be separated by a cofferdam, an empty space, a pump-room, an empty cargo tank or a cargo tank loaded with a substance which does not react with the cargo.

Where an empty, uncleaned cargo tank, or a cargo tank containing cargo residues of a substance liable to react dangerously with other dangerous goods, this separation is not required if the master has taken appropriate measures to avoid a dangerous reaction.

If the vessel is equipped with piping for loading and unloading below the deck passing through the cargo tanks, the mixed loading or carriage of substances likely to react dangerously with each other is prohibited.

7.2.4.13.2 Before the start of loading operations, any prescribed safety and control devices and any items of equipment shall, if possible, be checked and controlled for the proper functioning.

7.2.4.13.3 Before the start of loading operations the overflow control device switch shall be connected to the shore installation.

7.2.4.14 *Cargo handling and stowage*

Dangerous goods shall be loaded in the cargo area in cargo tanks, in cargo residue tanks or in packages permitted under 7.2.4.1.1.

7.2.4.15 *Measures to be taken after unloading*

NOTE: It is not necessary to apply this paragraph. The date of application will be defined later.

7.2.4.15.1 After each unloading operating the cargo tanks and the cargo piping shall be emptied by means of the stripping system in accordance with the conditions laid down in the testing procedure. This provision need not be complied with if the new cargo is the same as the previous cargo.

Residual cargo shall be discharged ashore by means of the equipment provided to that effect or shall be stored in the vessel's own residual cargo tank or stored in intermediate bulk containers (IBCs) or tank-containers or portable tanks permitted according to 7.2.4.1.1, 9.3.2.26.3 or 9.3.3.26.3.

7.2.4.15.2 During the filling of permitted residual cargo tanks, intermediate bulk containers (IBCs), tank-containers or portable tanks, gases shall be safely evacuated.

7.2.4.15.3 After additional stripping, cargo tanks and pipes for loading and unloading shall, if necessary, for example before undertaking repairs or maintenance, be cleaned or gas-freed. This cleaning and gas-freeing shall be checked by persons or companies approved by the competent authority. Gas-freeing shall only be carried out in places approved by the competent authority.

7.2.4.16 *Measures to be taken during loading, carriage, unloading and handling*

7.2.4.16.1 The loading rate and the maximum operational pressure of the cargo pumps shall be determined in agreement with the personnel of the shore installation.

7.2.4.16.2 All safety or control devices required in the cargo tanks shall remain switched on. During carriage this provision is only applicable for the installations mentioned in 9.3.1.21.1 (e) and (f), 9.3.2.21.1 (e) and (f) or 9.3.3.21.1 (e) and (f).

In the event of a failure of a safety or control device, loading or unloading shall be suspended immediately.

When a cargo pump-room is located below deck, the prescribed safety and control devices in the cargo pump-room shall remain permanently switched on.

Any failure of the gas detection system shall be immediately signalled in the wheelhouse and on deck by a visual and audible warning.

- 7.2.4.16.3 The shut-off devices of the loading and unloading piping as well as of the pipes of the stripping systems shall remain closed except during loading, unloading, stripping, cleaning or gas-freeing operations.
- 7.2.4.16.4 If the vessel is fitted with a transverse bulkhead according to 9.3.1.25.3, 9.3.2.25.3 or 9.3.3.25.3, the doors in this bulkhead shall be closed during loading and unloading.
- 7.2.4.16.5 Receptacles intended for recovering possible liquid spillage shall be placed under connections to shore installations used for loading and unloading. This requirement shall not apply to the carriage of substances of Class 2.
- 7.2.4.16.6 In case of recovery of the gas-air mixture from shore into the vessel, the pressure at the connection point shall not be more than the opening pressure of the high velocity vent valve.
- 7.2.4.16.7 When a tank vessel conforms to 9.3.2.25.5 (d) or 9.3.3.22.5 (d), the individual cargo tanks shall be closed off during transport and opened during loading, unloading and gas-freeing.
- 7.2.4.16.8 Persons entering the premises located in the below deck cargo area during loading or unloading shall wear the PP equipment referred to in 8.1.5 if this equipment is prescribed in column (18) of Table C of Chapter 3.2.
- Persons connecting or disconnecting the loading and unloading pipes or the vapour pipes or gas discharge pipes, or taking samples, carrying out measurements, replacing the flame arrester plate stack or relieving pressure in cargo tanks shall wear the PP equipment referred to in 8.1.5 if this equipment is prescribed in column (18) of Table C of Chapter 3.2. They shall also wear protective equipment A if a toximeter (TOX) is prescribed in column (18) of Table C of Chapter 3.2.
- 7.2.4.16.9 During loading or unloading in a closed tank vessel of substances for which an open type N vessel or an open type N vessel with a flame arrester is sufficient according to columns (6) and (7) of Table C of Chapter 3.2, the cargo tanks may be opened using the safe pressure-relief device referred to in 9.3.2.22.4 (a) or 9.3.3.22.4 (a).
- 7.2.4.16.10 7.2.4.16.9 shall not apply when the cargo tanks contain gases or vapour from substances for the carriage of which a closed-type tank vessel is required in column (7) of Table C of Chapter 3.2.
- 7.2.4.16.11 The nozzle closure referred to in 9.3.1.21.1 (g), 9.3.2.21.1 (g) or 9.3.3.21.1 (g) can be opened only after a gastight connection has been made to the closed or partly closed sampling device.
- 7.2.4.16.12 For substances requiring protection against explosions according to column (17) of Table C of Chapter 3.2, the connection of the vapour pipe or the gas discharge piping to the shore installation shall be such that the vessel is protected against detonations and the passage of flames from the shore. The protection of the vessel against detonations and the passage of flames from the shore is not required when the cargo tanks are inerted in accordance with 7.2.4.19.
- 7.2.4.16.13 For the carriage of substances of UN No. 2448, or of goods of Class 5.1 or 8, the bulwark ports, openings in the foot rail, etc., shall not be closed off. Nor shall they be closed off, during the voyage, in the event of carriage of other dangerous goods.

7.2.4.16.14 If supervision is required in column (20) of Table C of Chapter 3.2 for substances of Classes 2 or 6.1, loading and unloading shall be carried out under the supervision of a person who is not a member of the crew and has been mandated for the task by the consignor or the consignee.

7.2.4.16.15 The initial cargo throughput established in the loading instructions shall be such as to ensure that no electrostatic charge exists at the start of loading.

7.2.4.17 *Closing of windows and doors*

7.2.4.17.1 During loading, unloading and gas-freeing operations, all entrances or openings of spaces which are accessible from the deck and all openings of spaces facing the outside shall remain closed.

This provision does not apply to:

- air intakes of running engines;
- ventilation inlets of engine rooms while the engines are running;
- air intakes of the overpressure ventilation system referred to in 9.3.1.52.3, 9.3.2.52.3 or 9.3.3.52.3;
- air intakes of air conditioning in installations if these openings are fitted with a gas detection system referred to in 9.3.1.52.3, 9.3.2.52.3 or 9.3.3.52.3.

These entrances and openings may only be opened when necessary and for a short time, after the master has given his permission.

7.2.4.17.2 After the loading, unloading and gas-freeing operations, the spaces which are accessible from the deck shall be ventilated.

7.2.4.17.3 The provisions of 7.2.4.17.1 and 7.2.4.17.2 above shall not apply to the reception of oily and greasy wastes resulting from the operation of vessels nor to the handing over of products for the operation of vessels.

7.2.4.18 *Monitoring of gaseous phases in cargo tanks and adjacent empty spaces*

7.2.4.18.1 For the gaseous phases of cargo tanks, inerting or blanketing may be necessary. These are defined as follows:

- inerting: cargo tanks and their piping and other spaces for which this process is prescribed in column (20) of Table C of chapter 3.2 are filled with gases or vapours which prevent combustion, do not react with the cargo and maintain this state;
- blanketing: cargo tanks and their piping are filled with a liquid, gas or vapour which separates the cargo from the air and maintains this situation.

7.2.4.18.2 For certain substances the requirements for the monitoring of the gaseous phases in cargo tanks and in adjacent empty spaces are given in column (20) of Table C of Chapter 3.2.

7.2.4.18.3 *Inerting of tanks*

When anti-explosion protection is required in column (17) of Table C of Chapter 3.2 and inerting is required in column (20) of Table C of Chapter 3.2, cargo tanks and their piping shall be purged in an appropriate form of any air that may be present using inert gas and maintained in an air-free state.

7.2.4.18.4 Inerting or blanketing of flammable cargoes shall be carried out in such a way as to reduce the electrostatic charge as far as possible when the inerting agent is added.

7.2.4.19 *Inerting of tank vessels*

The cargo tanks of a closed tank vessel, loaded or empty, which have not been cleaned of substances for which the use of a closed tank vessel of type C or type N with anti-explosion protection is prescribed in columns (6), (7) and (17) of Table C of Chapter 3.2 shall be inerted in accordance with 7.2.4.18. The inerting shall be performed so as to ensure that the oxygen content is less than 8% in volume.

Inerting is not prescribed when the tank vessel is in conformity with 9.3.2.22.5 or 9.3.3.22.5.

7.2.4.20 *(Reserved)*

7.2.4.21 *Filling of cargo tanks*

7.2.4.21.1 The degree of filling given in column (11) of Table C of Chapter 3.2 or calculated in accordance with 7.2.4.21.3 below shall not be exceeded.

7.2.4.21.2 The provisions of 7.2.4.21.1 above do not apply to cargo tanks the contents of which are maintained at the filling temperature during carriage by means of heating equipment. In this case calculation of the degree of filling at the beginning of carriage and control of the temperature shall be such that, during carriage, the maximum allowable degree of filling is not exceeded.

7.2.4.21.3 For carriage of substances having a relative density higher than that stated in the certificate of approval, the degree of filling shall be calculated in accordance with the following formula.

$$\text{Permitted degree of filling (\%)} = \frac{a}{b} \times 100$$

a = relative density stated in the certificate of approval

b = relative density of the substance.

The degree of filling given in column (11) of Table C of Chapter 3.2 shall, however, not be exceeded.

7.2.4.21.4 If the degree of filling of 97.5% is exceeded a technical installation shall be authorized to pump off the overflow. During such an operation an automatic visual alarm shall be activated on deck.

7.2.4.22 *Opening of openings of cargo tanks*

7.2.4.22.1 Opening of cargo tanks apertures shall be permitted only after the tanks have been relieved of pressure.

7.2.4.22.2 Opening of sampling outlets and ullage openings and opening of the housing of the flame arrester shall not be permitted except for the purpose of inspecting or cleaning empty cargo tanks.

When in column (17) of Table C of Chapter 3.2 anti-explosion protection is required, the opening of cargo tank covers or of the housing of the flame arrester for the purpose of mounting or removing the flame arrester plate stack in unloaded cargo tanks shall be permitted only if the cargo tanks in question have been gas-freed and the concentration of flammable gases in the tanks is less than 10% of the lower explosive limit.

7.2.4.22.3 Sampling shall be permitted only if a device prescribed in column (13) of Table C of Chapter 3.2 or a device ensuring a higher level of safety is used.

Opening of sampling outlets and ullage openings of cargo tanks loaded with substances for which marking with one or two blue cones or one or two blue lights is prescribed in column (19) of Table C of Chapter 3.2 shall be permitted only when loading has been interrupted for not less than 10 minutes.

7.2.4.22.4 The sampling receptacles including all accessories such as ropes, etc., shall consist of electrostatically conductive material and shall, during sampling, be electrically connected to the vessel's hull.

7.2.4.22.5 The duration of opening shall be limited to the time necessary for control, cleaning, replacing the flame arrester, gauging or sampling.

7.2.4.22.6 Pressure relief of cargo tanks is permitted only when carried out by means of the device for safe pressure relief prescribed in 9.3.2.22.4 (a) or 9.3.3.22.4 (a).

7.2.4.22.7 The provisions of 7.2.4.22.1 to 7.2.4.22.6 above shall not apply to oil separator or supply vessels.

7.2.4.23 *(Reserved)*

7.2.4.24 *Simultaneous loading and unloading*

During loading or unloading of cargo tanks, no other cargo shall be loaded or unloaded. The competent authority may grant exceptions during unloading.

7.2.4.25 *Cargo piping*

7.2.4.25.1 Loading and unloading as well as stripping of cargo tanks shall be carried out by means of the fixed cargo piping of the vessel.

The metal fittings of the connections to the shore piping shall be electrically earthed so as to prevent the accumulation of electrostatic charges.

7.2.4.25.2 The loading and unloading piping shall not be extended by rigid or flexible pipes fore or aft beyond the cofferdams.

This requirement shall not apply to hoses used for the reception of oily and greasy wastes resulting from the operation of vessels and the delivery of products for the operation of vessels.

7.2.4.25.3 The shut-off devices of the loading and unloading cargo piping shall not be open except as necessary during loading, unloading or gas-freeing operations.

7.2.4.25.4 The liquid remaining in the piping shall be completely drained into the cargo tanks, if possible, or safely removed. This requirement shall not apply to supply vessels.

7.2.4.25.5 The gas/air mixtures shall be returned ashore through a gas recovery or compensation pipe during loading operations when a closed type vessel is required in column (7) of Table C of Chapter 3.2.

7.2.4.25.6 When substances of Class 2 are carried the requirements of 7.2.4.25.4 shall be deemed to have been satisfied if the pipes for loading and unloading have been purged with the cargo gas or with nitrogen.

7.2.4.26-
7.2.4.27 *(Reserved)*

7.2.4.28 *Water-spray system*

7.2.4.28.1 If a gas or vapour water-spray system is required in column (9) of Table C of Chapter 3.2, it shall be kept ready for operation during loading, unloading and carriage. If a water-spray system is required to cool the tank-deck, it shall be kept ready for operation during the carriage.

7.2.4.28.2 When water-spraying is required in column (9) of Table C of Chapter 3.2 and the pressure of the gaseous phase in the cargo tanks may reach 80% of the relief pressure of the high velocity vent valves, the master shall take all measures compatible with safety to prevent the pressure from reaching that value. He shall in particular activate the water-spray system.

7.2.4.28.3 If a water-spray system is required in column (9) of Table C of Chapter 3.2 and remark 23 is indicated in column (20) of Table C of Chapter 3.2, the instrument measuring the internal pressure shall activate an alarm when the internal pressure reaches 40 kPa (0.4 bar). The water-spray system shall immediately be activated and remain in operation until the internal pressure drops to 30 kPa (0.3 bar).

7.2.4.29-
7.2.4.39 *(Reserved)*

7.2.4.40 *Fire-extinguishing arrangements*

During loading and unloading, the fire extinguishing systems, the hoses and spray nozzles shall be kept ready for operation in the cargo area on deck.

7.2.4.41 *Fire or naked light*

During loading, unloading or gas-freeing operations fires and naked lights are prohibited on board the vessel.

However, the provisions of 7.2.3.42.3 and 7.2.3.42.4 are applicable.

7.2.4.42 *Cargo heating system*

The maximum allowable temperature for carriage indicated in column (20) of Table C of Chapter 3.2 shall not be exceeded.

7.2.4.43-
7.2.4.50 *(Reserved)*

7.2.4.51 *Electrical installations*

7.2.4.51.1 During loading, unloading or gas-freeing operations, only electrical equipment conforming to the rules for construction in Part 9 or which are installed in spaces complying with the conditions of 9.3.1.52.3, 9.3.2.52.3 or 9.3.3.52.3, may be used. All other electrical equipment marked in red shall be switched off.

7.2.4.51.2 Electrical equipment which has been switched off by the device referred to in 9.3.1.52.3, 9.3.2.52.3 or 9.3.3.52.3 shall only be switched on after the gas-free condition has been established in these spaces.

7.2.4.51.3 Equipment for active cathodic corrosion protection shall be disconnected before berthing and may not be re-connected until after the departure of the vessel, at earliest.

7.2.4.52 *(Reserved)*

7.2.4.53 *Lighting*

If loading or unloading is performed at night or in conditions of poor visibility, effective lighting shall be provided. If provided from the deck, it shall be effected by properly secured electric lamps which shall be positioned in such a way that they cannot be damaged. Where these lamps are positioned in the cargo area, they shall be of the “certified safe” type.

7.2.4.54-
7.2.4.59 *(Reserved)*

7.2.4.60 *Special equipment*

The shower and the eye and face bath prescribed in the rules for construction shall be kept ready in all weather conditions for use during loading and unloading operations and cargo transfer operations by pumping.

7.2.4.61-
7.2.4.73 *(Reserved)*

7.2.4.74 *Prohibition of smoking, fire and naked light*

The prohibition of smoking does not apply in accommodation or wheelhouses conforming to the provisions of 9.3.1.52.3, 9.3.2.52.3 or 9.3.3.52.3.

7.2.4.75 *Risk of sparking*

All electrical connections between the vessel and the shore shall be so designed that they do not present a source of ignition.

7.2.4.76 *Synthetic ropes*

During loading and unloading operations, the vessel may be moored by means of synthetic ropes only when steel cables are used to prevent the vessel from going adrift.

Steel cables sheathed in synthetic material or natural fibres are considered as equivalent when the minimum tensile strength required in accordance with the Regulations referred to in 1.1.4.6 is obtained from the steel strands.

Oil separator vessels may, however, be moored by means of synthetic ropes during the reception of oily and greasy wastes resulting from the operation of vessels, as may supply vessels during the delivery of products for the operation of vessels.

7.2.4.77-
7.2.4.99 *(Reserved)*

7.2.5 Additional requirements concerning the operation of vessels**7.2.5.0 Marking**

7.2.5.0.1 Vessels carrying dangerous goods listed in Table C of Chapter 3.2 shall display the number of blue cones or blue lights indicated in column (19) and in accordance with CEVNI. When because of the cargo carried no marking with blue cones or blue lights is prescribed but the concentration of flammable gases in the cargo tanks is 20% higher than the lower explosion limit, the number of blue cones or blue lights to be carried is determined by the last cargo for which this marking was required.

7.2.5.0.2 When more than one marking should apply to a vessel, the first of the options below shall apply:

- two blue cones or two blue lights; or
- one blue cone or one blue light.

7.2.5.0.3 By derogation from 7.2.5.0.1 above, and in accordance with the footnotes to article 3.14 of the CEVNI, the competent authority of a Contracting Party may authorize seagoing vessels temporarily operating in an inland navigation area on the territory of this Contracting Party, the use of the day and night signals prescribed in the Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas adopted by the Maritime Safety Committee of the International Maritime Organization (by night an all-round fixed red light and by day flag "B" of the International Code of Signals), instead of the signals prescribed in 7.2.5.0.1. The competent authority which has taken the initiative with respect to the derogation granted shall notify the Executive Secretary of the UNECE, who shall bring this derogation to the attention of the Administrative Committee.

7.2.5.1 Mode of navigation

The competent authorities may impose restrictions on the inclusion of tank vessels in pushed convoys of large dimension.

7.2.5.2 *(Reserved)*

7.2.5.3 Mooring

Vessels shall be moored securely, but in such a way that electrical power cables and flexible hoses are not subject to tensile strain and the vessels can be released quickly in an emergency.

7.2.5.4 Berthing

7.2.5.4.1 The distances from other vessels to be kept by berthed vessels carrying dangerous goods shall be not less than those prescribed by the Regulations referred to in 1.1.4.6.

7.2.5.4.2 An expert, as required by 7.2.3.15 shall be permanently on board berthed vessels carrying dangerous substances. The competent authority may, however, exempt from this obligation those vessels which are berthed in the harbour basin or in a permitted berthing position.

7.2.5.4.3 Outside the berthing areas specifically designated by the competent authority, the distances to be kept by berthed vessels shall not be less than:

- 100 m from residential areas, civil engineering structures or storage tanks, if the vessel is required to be marked with one blue cone or blue light in accordance with column (19) of Table C of Chapter 3.2;
- 100 m from civil engineering structures and storage tanks; and 300 m from residential areas if the vessel is required to be marked with two blue cones or two blue lights in accordance with column (19) of Table C of Chapter 3.2.

While waiting in front of locks or bridges, vessels are allowed to keep distances less than those given above. In no case shall the distance be less than 100 m.

7.2.5.4.4 The competent authority may prescribe distances less than those given in 7.2.5.4.3 above.

7.2.5.5-
7.2.5.7 (*Reserved*)

7.2.5.8 Reporting duty

7.2.5.8.1 In the States where the reporting duty is in force, the master of a vessel for which marking in accordance with 7.2.5.0 is required shall, prior to the start of any voyage, report the following particulars to the competent authority of the State in which the voyage has started:

- name of the vessel;
- official number;
- dead-weight tonnage;
- description of the dangerous substances carried as given in the transport document (information according to 5.4.1.1.2 (a) to (d)) together with the quantity in each case;
- number of persons on board;
- port of destination; and
- planned shipping route.

This reporting duty shall apply in each State territory once to both passages upstream and downstream so far as the competent authorities so require. The information may be given orally (e.g. by radio-telephone, where appropriate by automatic wireless message service) or in writing.

7.2.5.8.2 When passing the other traffic control stations designated by the competent authority, the following particulars shall be reported:

- name of the vessel;
- official number;
- dead-weight tonnage.

7.2.5.8.3 Changes to any of the particulars referred to in 7.2.5.8.1 shall be reported to the competent authority without delay.

7.2.5.8.4 The information is confidential and shall not be passed on to third parties by the competent authority.

The competent authority may, however, in the event of an accident, inform the emergency services of the relevant particulars required for organizing emergency action.

7.2.5.9- (*Reserved*)
7.2.9.99

PART 8

Provisions for vessel crews, equipment, operation and documentation

CHAPTER 8.1**GENERAL REQUIREMENTS APPLICABLE TO VESSELS AND EQUIPMENT**

8.1.1 *(Reserved)*

8.1.2 Documents

8.1.2.1 In addition to the documents required by other regulations, the following documents shall be kept on board:

- (a) The vessel's certificate of approval referred to in 8.1.8;
- (b) Transport documents referred to in 5.4.1 for all dangerous goods on board and, where necessary the container packing certificate (see 5.4.2);
- (c) The instructions in writing prescribed in 5.4.3;
- (d) A copy of the ADN with the latest version of its annexed Regulations which may be a copy which can be consulted by electronic means at any time;
- (e) The inspection certificate of the insulation resistance of the electrical installations prescribed in 8.1.7;
- (f) The inspection certificate of the fire-extinguishing equipment and fire-hoses prescribed in 8.1.6.1;
- (g) A book in which all required measurement results are recorded;
- (h) A copy of the relevant text of the special authorizations referred to in 1.5 if the transport operation is performed under this/these special authorization(s);
- (i) Means of identification, which include a photograph, for each crew member, in accordance with 1.10.1.4; and
- (j) The checklist or a certificate showing the result of the check drawn up by the competent authority which carried it out, referred to in 1.8.12. The most recent list or certificate shall be kept on board.

8.1.2.2 In addition to the documents prescribed in 8.1.2.1, the following documents shall be carried on board dry cargo vessels:

- (a) The loading plan prescribed in 7.1.4.11;
- (b) The ADN specialized knowledge certificate prescribed in 8.2.1.2;
- (c) For vessels complying with the additional requirements for double-hull vessels:
 - a damage-control plan;
 - the documents concerning intact stability as well as all conditions of intact stability taken into account for the damaged stability calculation in a form the master understands;
 - the certificate of the classification society (see 9.1.0.88 or 9.2.0.88).

8.1.2.3 In addition to the documents prescribed in 8.1.2.1, the following documents shall be carried on board tank vessels:

- (a) The cargo stowage plan prescribed in 7.2.4.11.2;
- (b) The ADN specialized knowledge certificate prescribed in 7.2.3.15;
- (c) For vessels which have to conform to the conditions of damage-control (see 9.3.1.15, 9.3.2.15 or 9.3.3.15)
 - a damage-control plan;
 - the documents concerning intact stability as well as all conditions of intact stability taken into account for the damaged stability calculation in a form the master understands;
- (d) The documents concerning the electrical installations prescribed in 9.3.1.50, 9.3.2.50 or 9.3.3.50;
- (e) The classification certificate prescribed in 9.3.1.8, 9.3.2.8 or 9.3.3.8;
- (f) The flammable gas detector certificate prescribed in 9.3.1.8.3, 9.3.2.8.3 or 9.3.3.8.3;
- (g) The certificate listing all dangerous goods accepted for carriage in the vessel, referred to in 1.11.1.2.5;
- (h) The inspection certificate for the pipes for loading and unloading prescribed in 8.1.6.2;
- (i) The instructions relating to the loading and unloading flows prescribed in 9.3.2.25.9 or 9.3.3.25.9;
- (j) The inspection certificate for the stripping installation prescribed in 8.6.4.2;

NOTE: It is not necessary to apply this paragraph. The date of application will be defined later.

- (k) In the event of the carriage of goods having a melting point $\geq 0^{\circ}\text{C}$, heating instructions;
- (l) The inspection certificate for the pressure relief and vacuum relief valves prescribed in 8.1.6.5, except for open type N tank vessels, or open type N vessels with flame-arresters;
- (m) The registration document referred to in 8.1.11;
- (n) For the carriage of refrigerated substances, the instruction required in 7.2.3.28; and
- (o) The certificate concerning the refrigeration system, prescribed in 9.3.1.27.10.

8.1.2.4 The instructions in writing referred to in 5.4.3 shall be handed to the master before loading. They shall be kept readily at hand in the wheelhouse.

On board dry cargo vessels, the transport documents shall be handed to the master before loading and on board tank vessels they shall be handed to him after loading.

8.1.2.5 *(Reserved)*

- 8.1.2.6 The presence on board of the certificate of approval is not required in the case of pusher barges which are not carrying dangerous goods, provided that the following additional particulars are indicated, in identical lettering, on the metal plate furnished by CEVNI:

Number of the certificate of approval: ...
issued by: ...
valid until: ...

The barge-owner shall thereafter keep the certificate of approval in his possession.

The similarity of the particulars on the plate and those contained in the certificate of approval shall be certified by a competent authority which shall affix its stamp to the plate.

- 8.1.2.7 The presence on board of the certificate of approval is not required in the case of dry cargo barges or tank barges carrying dangerous goods provided that the metal plate furnished by CEVNI is supplemented by a second metal plate reproducing by photo-optical means a copy of the entire certificate of approval.

The barge-owner shall thereafter keep the certificate of approval in his possession.

The similarity of the particulars on the metal plate and the certificate of approval shall be certified by a competent authority which shall affix its stamp to the plate.

- 8.1.2.8 All documents shall be drawn up in a language the master is able to read and understand and if that language is not English, French or German, in English, French or German unless agreements concluded between the countries concerned in the transport operation provide otherwise.

- 8.1.2.9 8.1.2.1 (b), 8.1.2.1 (g), 8.1.2.4 and 8.1.2.5 do not apply to oil separator vessels or supply vessels. 8.1.2.1 (c) does not apply to oil separator vessels.

- 8.1.3 (*Reserved*)

8.1.4 Fire-extinguishing arrangements

In addition to the fire-extinguishing appliances prescribed in the Regulations referred to in 1.1.4.6, each vessel shall be equipped with at least two additional hand fire-extinguishers having the same capacity. The fire-extinguishing agent contained in these additional hand fire-extinguishers shall be suitable for fighting fires involving the dangerous goods carried.

8.1.5 Special equipment

- 8.1.5.1 Insofar as the provisions of Chapter 3.2, Tables A or C require, the following equipment shall be available on board:

PP: for each member of the crew, a pair of protective goggles, a pair of protective gloves, a protective suit and a suitable pair of protective shoes (or protective boots, if necessary). On board tank vessels, protective boots are required in all cases;

EP: a suitable escape device for each person on board;

EX: a flammable gas detector with the instructions for its use;

TOX: a toximeter with the instructions for its use;

A: a breathing apparatus ambient air-dependent;

8.1.5.2 (Reserved)

8.1.5.3 For pushed convoys or side-by-side formations under way, it shall be sufficient, however, if the pusher tug or the vessel propelling the formation is equipped with the special equipment referred to in 8.1.5.1 above, when this is required in Chapter 3.2, Tables A or C.

8.1.6 Checking and inspection of equipment

8.1.6.1 The fire-extinguishing appliances and hoses shall be inspected at least once every two years by persons authorized for this purpose by the competent authority. Proof of inspection shall be affixed to the fire-extinguishing appliances. A certificate concerning this inspection shall be carried on board.

8.1.6.2 Hoses and hose assemblies used for loading, unloading or delivering products shall comply with European standard EN 12115:1999 (Rubber and thermoplastics hoses and hose assemblies) or EN 13765:2003 (Thermoplastic multilayer (non-vulcanized) hoses and hose assemblies) or EN ISO 10380:2003 (Corrugated metal hoses and hose assemblies). They shall be checked and inspected in accordance with table 6 of standard EN 12115:1999 or table K.1 of standard EN 13765:2003 or paragraph 7 of standard EN ISO 10380:2003 at least once a year, according to the manufacturer's instructions, by persons authorized for this purpose by the competent authority. A certificate concerning this inspection shall be carried on board.

8.1.6.3 The special equipment referred to in 8.1.5.1 and the gas detection system shall be checked and inspected in accordance with the instructions of the manufacturer concerned by persons authorized for this purpose by the competent authority. A certificate concerning this inspection shall be carried on board.

8.1.6.4 The measuring instruments prescribed in 8.1.5.1 shall be checked each time before use by the user in accordance with the instructions for use.

8.1.6.5 The pressure relief and vacuum relief valves prescribed in 9.3.1.22, 9.3.2.22, 9.3.2.26.4, 9.3.3.22 and 9.3.3.26.4 shall be inspected on each renewal of the certificate of approval by the manufacturer or by a firm approved by the manufacturer. A certificate concerning this inspection shall be carried on board.

8.1.6.6 The stripping system referred to in 9.3.2.25.10 or 9.3.3.25.10 shall be subjected to a water test before its first use or after a modification. The test and the establishment of the residual quantities shall be carried out in accordance with the provisions of 8.6.4.2. The certificate concerning the test referred to in 8.6.4.3 shall be carried on board.

NOTE: It is not necessary to apply this paragraph. The date of application will be defined later.

8.1.7 Electrical installations

The insulation resistance of the electrical installations, the earthing and the certified safe type electrical equipment and the conformity of the documents required in 9.3.1.50.1, 9.3.2.50.1 or 9.3.3.50.1 with the circumstances on board shall be inspected whenever the certificate of approval is renewed and, in addition, within the third year from the date of issue of the certificate of approval by a person authorized for this purpose by the competent authority. An appropriate inspection certificate shall be kept on board.

8.1.8 Certificate of approval

8.1.8.1 Dry cargo vessels carrying dangerous goods in quantities greater than exempted quantities, the vessels referred to in 7.1.2.19.1, tank vessels carrying dangerous goods and the vessels referred to in 7.2.2.19.3 shall be provided with an appropriate certificate of approval.

8.1.8.2 The certificate of approval shall attest that the vessel has been inspected and that its construction and equipment comply with the requirements of these Regulations.

8.1.8.3 The certificate of approval shall be issued in accordance with the requirements and procedures set out in Chapter 1.16.

It shall conform to the model in 8.6.1.1 or 8.6.1.3.

For tank vessels, the relief pressure of the safety valves or of the high-velocity vent valves shall be entered in the certificate of approval.

If a vessel has cargo tanks with different valve opening pressures, the opening pressure of each tank shall be entered in the certificate of approval.

NOTE: For procedures concerning:

- *the issue of certificates: see 1.16.2;*
- *the application for issue of certificates: see 1.16.5;*
- *the amendments to be made to the certificate of approval: see 1.16.6;*
- *the presentation of the vessel for inspection: see 1.16.7;*
- *the first inspection (if the vessel does not yet have the certificate of approval or if the validity of the certificate of approval expired more than six months ago): see 1.16.8;*
- *the special inspection (if the vessel's hull or equipment has undergone alterations liable to diminish safety in respect of the carriage of dangerous goods or has sustained damage affecting such safety): see 1.16.9;*
- *the periodic inspection for the renewal of the certificate of approval: see 1.16.10;*
- *the extension of the certificate of approval without an inspection: see 1.16.11;*
- *the right of official inspection by the competent authority of a Contracting Party: see 1.16.12;*
- *the withholding and return of the certificate of approval: see 1.16.13;*
- *the issue of a duplicate copy: see 1.16.14;*

8.1.8.4 The certificate of approval shall be valid for not more than five years. The date on which the period of validity expires shall be shown on the certificate. The competent authority which issued the certificate may, without inspection of the vessel, extend the validity of the certificate by not more than one year. Such extension may be granted only once within two periods of validity (see 1.16.11).

- 8.1.8.5 If the vessel's hull or equipment has undergone alterations liable to reduce the safety as regards the carriage of dangerous goods or has sustained damage affecting such safety, the vessel shall undergo a further inspection in (see 1.16.9).
- 8.1.8.6 The certificate of approval may be withdrawn if the vessel is not properly maintained or if the vessel's construction or equipment no longer complies with the applicable provisions of these Regulations (see 1.16.13).
- 8.1.8.7 The certificate of approval may only be withdrawn by the authority by which it has been issued.

Nevertheless, in the cases referred to in 8.1.8.5 and 8.1.8.6 above, the competent authority of the State in which the vessel is staying may prohibit its use for the carriage of those dangerous goods for which the certificate is required. For this purpose it may withdraw the certificate until such time as the vessel again complies with the applicable provisions of these Regulations. In that case it shall notify the competent authority which issued the certificate.

- 8.1.8.8 Notwithstanding 8.1.8.7 above, any competent authority may amend or withdraw the certificate of approval at the request of the vessel's owner, provided that it so notifies the competent authority which issued the certificate.

8.1.9 Provisional certificate of approval

NOTE: *For procedures concerning the issue of certificates, see Chapter 1.16.*

- 8.1.9.1 For a vessel which is not provided with a certificate of approval, a provisional certificate of approval of limited duration may be issued in the following cases, subject to the following conditions:
- (a) The vessel complies with the applicable provisions of these Regulations, but the normal certificate of approval could not be issued in time. The provisional certificate of approval shall be valid for an appropriate period but not exceeding three months;
 - (b) The vessel does not comply with every applicable provisions of these Regulations after sustaining damage. In this case the provisional certificate of approval shall be valid only for a single specified voyage and for a specified cargo. The competent authority may impose additional conditions.

- 8.1.9.2 The provisional certificate of approval shall conform to the model in 8.6.1.2 or 8.6.1.4 of these Regulations or a single model certificate combining a provisional certificate of inspection and the provisional certificate of approval provided that the single model certificate contains the same information as 8.6.1.2 or 8.6.1.4 and is approved by the competent authority.

8.1.10 Loading journal

NOTE: *It is not necessary to apply this paragraph. The date of application will be defined later.*

All tank vessels shall be provided with a loading journal in accordance with the provisions of the CEVNI. The original of the loading journal shall be kept on board for not less than 12 months after the last entry is made.

The first loading journal shall be issued by the authority which issued the certificate of approval. Subsequent journals may be issued by authorities competent to do so.

8.1.11 Register of operations during carriage relating to the carriage of UN 1203

Tank vessels accepted for the carriage of UN No. 1203 petrol shall have on board a register of operations during carriage. This register may consist of other documents containing the information required. This register or these other documents shall be kept on board for not less than three months and cover at least the last three cargoes.

CHAPTER 8.2

REQUIREMENTS CONCERNING TRAINING

8.2.1 General requirements concerning training of experts

8.2.1.1 An expert shall not be less than 18 years of age.

8.2.1.2 An expert is a person who has a special knowledge of the ADN. Proof of this knowledge shall be furnished by means of a certificate from a competent authority or from an agency recognized by the competent authority.

This certificate shall be issued to persons who, after training, have passed a qualifying ADN examination.

8.2.1.3 The experts referred to in 8.2.1.2 shall take part in a basic training course. Training shall take place in the context of classes approved by the competent authority. The primordial objective of the training is to make the experts aware of the hazards of the carriage of dangerous goods and provide them with the necessary basic knowledge to reduce the dangers of an incident to a minimum, to enable them to take the necessary measures to ensure their own safety, general safety and the protection of the environment and to limit the consequences of the incident. This training, which shall include individual practical exercises, takes the form of a basic course; it shall cover at least the objectives referred to in 8.2.2.3.1.1 and in 8.2.2.3.1.2 or 8.2.2.3.1.3.

8.2.1.4 After five years the expert shall furnish proof, in the form of relevant particulars entered in the certificate by the competent authority or by a body recognized by it, of participation in a refresher course taken in the last year prior to the expiry of the certificate, covering at least the objectives referred to in 8.2.2.3.1.1 and in 8.2.2.3.1.2 or 8.2.2.3.1.3 and comprising current new developments in particular. The new period of validity shall begin on the expiry date of the certificate; in other cases it shall begin on the date of the certificate of participation in the course.

8.2.1.5 Experts for the carriage of gases shall take part in a specialization course covering at least the objectives referred to in 8.2.2.3.3.1. Training shall take place in the context of classes approved by the competent authority. An expert certificate shall be issued to persons who, after training, have successfully passed an examination concerning the carriage of gases and have produced evidence of not less than one year's work on board a type G vessel during a period of two years prior to or following the examination.

8.2.1.6 After five years, the expert for the carriage of gases shall furnish proof, in the form of relevant particulars entered in the certificate by the competent authority or by a body recognized by it,

- that during the year preceding the expiry of the certificate, he has participated in a refresher specialization course covering at least the objectives referred to in 8.2.2.3.3.1 and comprising current new developments in particular, or
- that during the previous two years he has performed a period of work of not less than one year on board a type G tank vessel.

When the refresher specialization training course is taken in the year preceding the date of expiry of the certificate, the new period of validity shall begin on the expiry date of the preceding certificate, but in other cases it shall begin on the date of certification of participation in the course.

8.2.1.7 Experts for the carriage of chemicals shall take part in a specialization course covering at least the objectives referred to in 8.2.2.3.3.2. Training shall take place in the context of classes approved by the competent authority. An expert certificate shall be issued to persons who, after training, have successfully passed an examination concerning the carriage of chemicals and have produced evidence of not less than one year's work on board a type C vessel during a period of two years prior to or following the examination.

8.2.1.8 After five years, the expert for the carriage of chemicals shall furnish proof, in the form of relevant particulars entered in the certificate by the competent authority or by a body recognized by it,

- that during the year preceding the expiry of the certificate, he has participated in a refresher specialization course covering at least the objectives referred to in 8.2.2.3.3.2 and comprising current new developments in particular, or
- that during the previous two years he had performed a period of work of not less than one year on board a type C tank vessel.

When the refresher specialization training course is taken in the year preceding the date of expiry of the certificate, the new period of validity shall begin on the expiry date of the preceding certificate, but in other cases it shall begin on the date of certification of participation in the course.

8.2.1.9 The document attesting training and experience in accordance with the requirements of Chapter V of the STCW Code on Training and Qualifications of Masters, Officers and Ratings of Tankers carrying LPG/LNG shall be equivalent to the certificate referred to in 8.2.1.5, provided it has been recognized by a competent authority. No more than five years shall have passed since the date of issue or renewal of such a document.

8.2.1.10 The document attesting training and experience in accordance with Chapter V of the STCW Code on Training and Qualifications of Masters, Officers and Ratings of Tankers carrying chemicals in bulk shall be equivalent to the certificate referred to in 8.2.1.7, provided it has been recognized by a competent authority. No more than five years shall have passed since the date of issue or renewal of such a document.

8.2.1.11 The certificate shall conform to the model in 8.6.2.

8.2.2 Special requirements for the training of experts

8.2.2.1 Theoretical knowledge and practical abilities shall be acquired as a result of training in theory and practical exercises. The theoretical knowledge shall be tested by an examination. During the refresher and advanced courses exercises and tests shall ensure that the participant takes an active role in the training.

8.2.2.2 The training organizer shall ensure that training instructors have a good knowledge of the subject and shall take into account the latest developments concerning the Regulations and the requirements for training in the transport of dangerous goods. Teaching shall relate closely to practice. In accordance with the approval, the teaching syllabus shall be drawn up on the basis of the objectives referred to in 8.2.2.3.1.1 to 8.2.2.3.1.3 and in 8.2.2.3.3.1 or 8.2.2.3.3.2. Basic training and their refresher courses shall comprise individual practical exercises (see 8.2.2.3.1.1).

8.2.2.3 Organization of training

Initial basic training and the refresher courses shall be organized in the context of basic courses (see 8.2.2.3.1) and if necessary specialization courses (see 8.2.2.3.3). The courses

referred to in 8.2.2.3.1 may comprise three variants: transport of dry cargo, transport in tank vessels and a combination of transport of dry cargo and transport in tank vessels.

8.2.2.3.1

*Basic course**Basic course on the transport of dry cargo*

Prior training: none
 Knowledge: ADN in general, except Chapter 3.2, Table C, Chapters 7.2 and 9.3
 Authorized for: dry cargo vessel
 Training: general 8.2.2.3.1.1 and dry cargo vessels 8.2.2.3.1.2

Basic course on transport by tank vessels

Prior training: none
 Knowledge: ADN in general, except Chapter 3.2, Tables A and B, Chapters 7.1, 9.1, 9.2 and sections 9.3.1 and 9.3.2
 Authorized for: tank vessels for the transport of substances for which a type N tank vessel is prescribed
 Training: general 8.2.2.3.1.1 and tank vessels 8.2.2.3.1.3

Basic course - combination of transport of dry cargo and transport in tank vessels

Prior training: none
 Knowledge: ADN in general, except sections 9.3.1 and 9.3.2
 Authorized for: dry cargo vessels and tank vessels for the transport of substances for which a type N tank vessel is prescribed
 Training: general 8.2.2.3.1.1, dry cargo vessels 8.2.2.3.1.2 and tank vessels 8.2.2.3.1.3

8.2.2.3.1.1

The general part of the basic training course shall comprise at least the following objectives:

General:

- Objectives and structure of ADN.

Construction and equipment:

- Construction and equipment of vessels subject to ADN.

Measurement techniques:

- Measurements of toxicity, oxygen content, explosivity.

Knowledge of products:

- Classification and hazard characteristics of the dangerous goods.

Loading, unloading and transport:

- Loading, unloading, general service requirements and requirements relating to transport.

Documents:

- Documents which must be on board during transport.

Hazards and measures of prevention:

- General safety measures.

Practical exercises:

- Practical exercises, in particular with respect to entry into spaces, use of fire-extinguishers, fire-fighting equipment and personal protective equipment as well as flammable gas detectors, oxygen meters and toximeters.

8.2.2.3.1.2 The “dry cargo vessels” part of the basic training course shall comprise at least the following objectives:

Construction and equipment:

- Construction and equipment of dry cargo vessels.

Treatment of holds and adjacent spaces:

- degassing, cleaning, maintenance,
- ventilation of holds and spaces outside the protected area.

Loading, unloading and transport:

- loading, unloading, general service and transport requirements,
- labelling of packages.

Documents:

- documents which must be on board during transport.

Hazards and measures of prevention:

- general safety measures,
- personal protective and safety equipment.

8.2.2.3.1.3 The “tank vessel” part of the basic training course shall comprise at least the following objectives:

Construction and equipment:

- construction and equipment of tank vessels,
- ventilation,
- loading and unloading systems.

Treatment of cargo tanks and adjacent spaces:

- degassing, cleaning, maintenance,
- heating and cooling of cargo,
- handling of residual cargo tanks.

Measurement and sampling techniques:

- measurements of toxicity, oxygen content and explosivity,
- sampling.

Loading, unloading and transport:

- loading, unloading, general service and transport requirements.

Documents:

- documents which must be on board during transport.

Hazards and measures of prevention:

- prevention and general safety measures,
- spark formation,
- personal protective and safety equipment,
- fires and fire-fighting.

8.2.2.3.2 *Refresher training courses*

Refresher training course on transport of dry cargo

Prior training: valid ADN “dry cargo vessels” or combined “dry cargo vessels/tank vessels” certificate
 Knowledge: ADN in general, except Chapter 3.2, Table C, Chapters 7.2 and 9.3
 Authorized for: dry cargo vessel
 Training: general 8.2.2.3.1.1 and dry cargo vessels 8.2.2.3.1.2

Refresher training course on transport in tank vessels

Prior training: valid ADN “tank vessels” or combined “dry cargo vessels/tank vessels” certificate
 Knowledge: ADN in general, except Chapter 3.2, Tables A and B, Chapters 7.1, 9.1 and 9.2 and sections 9.3.1 and 9.3.2
 Authorized for: tank vessels for the transport of substances for which a type N tank vessel is prescribed
 Training: general 8.2.2.3.1.1 and tank vessels 8.2.2.3.1.3

Refresher training course – combination of transport of dry cargo and transport in tank vessels

Prior training: valid ADN combined “dry cargo vessels and tank vessels” certificate
 Knowledge: ADN in general, including sections 9.3.1 and 9.3.2
 Authorized for: dry cargo vessels and tank vessels for the transport of substances for which a type N tank vessel is prescribed
 Training: general 8.2.2.3.1.1, dry cargo vessels 8.2.2.3.1.2 and tank vessels 8.2.2.3.1.3

8.2.2.3.3 *Specialization courses*

Specialization course on gases

Prior training: valid ADN “tank vessels” or combined “dry cargo vessels/tank vessels” certificate
 Knowledge: ADN, in particular knowledge relating to loading, transport, unloading and handling of gases
 Authorization for: tank vessels for the transport of substances for which a type G tank vessel is required and transport in type G of substances for which a

Training: type C is required with cargo tank design 1 required in column (7) of Table C of Chapter 3.2.
gases 8.2.2.3.3.1

Specialization course on chemicals

Prior training: valid ADN “tank vessels” or combined “dry cargo vessels/tank vessels” certificate
 Knowledge: ADN, in particular knowledge relating to loading, transport, unloading and handling of chemicals
 Authorized for: tank vessels for the transport of substances for which a type C tank vessel is required
 Training: chemicals 8.2.2.3.3.2

8.2.2.3.3.1 The specialization course on gases shall comprise at least the following objectives:

Knowledge of physics and chemistry:

- laws of gases, e.g. Boyle, Gay-Lussac and fundamental law
- partial pressures and mixtures, e.g. definitions and simple calculations, pressure increase and gas release from cargo tanks
- Avogadro’s number and calculation of masses of ideal gas and application of the mass formula
- density and volume of liquids, e.g. density, volume in terms of temperature increase and maximum degree of filling
- critical pressure and temperature
- polymerization, e.g. theoretical and practical questions, conditions of carriage
- vaporization, condensation, e.g. definition, liquid volume and vapour volume ratio
- mixtures, e.g. vapour pressure, composition and hazard characteristics
- chemical bonds and formulae.

Practice:

- flushing of cargo tanks, e.g. flushing in the event of a change of cargo, addition of air to the cargo, methods of flushing (degassing) before entering cargo tanks
- sampling
- danger of explosion
- health risks
- gas concentration measures, e.g. which apparatus to use and how to use it
- monitoring of closed spaces and entry to these spaces
- certificates for degassing and permitted work
- degree of filling and over-filling
- safety installations
- pumps and compressors.

Emergency measures:

- physical injury, e.g. substances on the skin, breathing in gas, assistance
- irregularities relating to the cargo, e.g. leak in a connection, over-filling, polymerization and hazards in the vicinity of the vessel.

8.2.2.3.3.2 The specialization course on chemicals shall comprise at least the following objectives:

Knowledge of physics and chemistry:

- chemical products, e.g. molecules, atoms, physical state, acids, bases, oxidation

- density, pressure and volume of liquids, e.g. density, volume and pressure in terms of temperature increase, maximum degree of filling
- critical temperature
- polymerization, e.g. theoretical and practical questions, conditions of carriage
- mixtures, e.g. vapour pressure, composition and hazard characteristics
- chemical bonds and formulae.

Practice:

- cleaning of cargo tanks, e.g. degassing, washing, residues, cargo residues
- loading and unloading, e.g. vapour pipes systems, rapid closing devices, effects of temperature
- sampling
- danger of explosion
- health risks
- gas concentration measures, e.g. which apparatus to use and how to use it
- monitoring of closed spaces and entry to these spaces
- certificates for degassing and permitted work
- degree of filling and over-filling
- safety installations
- pumps and compressors.

Emergency measures:

- physical injury, e.g. contact with the cargo, breathing in gas, assistance
- irregularities relating to the cargo, e.g. leak in a connection, over-filling, polymerization and hazards in the vicinity of the vessel.

8.2.2.3.4 *Refresher and advanced training courses**Refresher and advanced training course on gases*

Prior training:	valid ADN ‘gases’ and ‘tank vessels’ certificate or combined ‘dry cargo/tank vessels’ certificate;
Knowledge:	ADN, in particular, loading, transport, unloading and handling of gases;
Authorization for:	tank vessels for the transport of substances for which a type G tank vessel is required and transport in type G of substances for which a type C is required with cargo tank design 1 required in column (7) of Table C of Chapter 3.2.
Training:	gases 8.2.2.3.3.1.

Refresher and advanced training course on chemicals

Prior training:	valid ADN “chemicals” and “tank vessels” certificate or combined “dry cargo/tank vessels” certificate;
Knowledge:	ADN, in particular, loading, transport, unloading and handling of gases;
Authorization for:	tank vessels for the transport of substances for which a type C tank vessel is required;
Training:	chemicals 8.2.2.3.3.2.

8.2.2.4 *Planning of refresher and specialization courses*

The following minimum periods of training shall be observed:

Basic "dry cargo vessels course"	24 lessons of 45 minutes each
Basic "tank vessels" course	24 lessons of 45 minutes each
Basic combined course	32 lessons of 45 minutes each
Specialization course on gases	16 lessons of 45 minutes each
Specialization course on chemicals	16 lessons of 45 minutes each

Each day of training may comprise not more than eight lessons.

If the theoretical training is by correspondence, equivalences to the above-mentioned lessons shall be determined. Training by correspondence shall be completed within a period of nine months.

Approximately 30% of basic training shall be devoted to practical exercises. Practical exercises shall, where possible, be undertaken during the period of theoretical training; in any event, they shall be completed not later than three months following the completion of theoretical training.

8.2.2.5 *Planning of refresher and advanced training courses*

The refresher and advanced training courses shall take place before the expiry of the deadline referred to in 8.2.1.4, 8.2.1.6 or 8.2.1.8.

The following minimum periods of training shall be observed:

Basic refresher course:

- | | |
|---|-------------------------------|
| - dry cargo vessels | 16 lessons of 45 minutes each |
| - tank vessels | 16 lessons of 45 minutes each |
| - combined dry cargo vessels and tank vessels | 16 lessons of 45 minutes each |

Specialization refresher course on gases	8 lessons of 45 minutes each
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Specialization refresher course on chemicals	8 lessons of 45 minutes each
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Each day of training may comprise not more than eight lessons.

Approximately 50% of basic training shall be devoted to practical exercises. Practical exercises shall, where possible, be undertaken during the period of theoretical training; in any event, they shall be completed not later than three months following the completion of theoretical training.

8.2.2.6 *Approval of training courses*

8.2.2.6.1 Training courses shall be approved by the competent authority.

8.2.2.6.2 Approval shall be granted only on written application.

8.2.2.6.3 Applications for approval shall be accompanied by:

- (a) the detailed course curriculum showing the course topics and the length of time to be devoted to them, as well as the teaching methods envisaged;
- (b) the roster of training instructors, listing their qualifications and the subjects to be taught by each one;

(c) information on classrooms and teaching materials, as well as on the facilities available for practical exercises;

(d) enrolment requirements, e.g. the number of participants.

8.2.2.6.4 The competent authority shall be responsible for monitoring training courses and examinations.

8.2.2.6.5 The approval comprises the following conditions, *inter alia*:

(a) training courses shall conform to the information accompanying the application for approval;

(b) the competent authority may send inspectors to attend training courses and examinations;

(c) the timetables for the various training courses shall be notified in advance to the competent authority.

Approval shall be granted in writing. It may be withdrawn in the event of failure to comply with the conditions of approval.

8.2.2.6.6 The approval document shall indicate whether the course in question is a basic training course, a specialization course or a refresher and advanced training course.

8.2.2.6.7 If, after approval is granted, the training body wishes to change conditions affecting the approval, he shall seek the prior agreement of the competent authority. This provision shall apply in particular to amendments to syllabuses.

8.2.2.6.8 Training courses shall take account of the current developments in the various subjects taught. The course organizer shall be responsible for ensuring that recent developments are brought to the attention of, and properly understood by, training instructors.

8.2.2.7 Examinations

8.2.2.7.0 The examination shall be organized by the competent authority or by an examining body designated by the competent authority. The examining body shall not be a training provider.

The examining body shall be designated in writing. This approval may be of limited duration and should be based on the following criteria:

- Competence of the examining body;
- Specifications of the form of the examinations the examining body is proposing;
- Measures intended to ensure that examinations are impartial;
- Independence of the body from all natural or legal persons employing ADN experts.

8.2.2.7.1 *Basic training courses*

8.2.2.7.1.1 After initial training and ADN basic training examination shall be taken. This examination shall be held either immediately after the training or within six months following the completion of such training.

- 8.2.2.7.1.2 In the examination the candidate shall furnish evidence that, in accordance with the basic training course, he has the knowledge, understanding and capabilities required of an expert on board a vessel.
- 8.2.2.7.1.3 The Administrative Committee shall establish a list of questions comprising the objectives set out in 8.2.2.3.1.1 to 8.2.2.3.1.3. The examination questions shall be selected from this list. The candidate shall not have advance knowledge of the questions selected.
- 8.2.2.7.1.4 The model attached to the list of questions is to be used to compile the examination questions.
- 8.2.2.7.1.5 The examination shall be written. Candidates shall be asked 30 questions. The examination shall last 60 minutes. It is deemed to have been passed if at least 25 of the 30 questions have been answered correctly. During the examination, candidates may consult the texts of regulations on dangerous goods and CEVNI.
- 8.2.2.7.2 *Specialization course on gases and chemicals*
- 8.2.2.7.2.1 Candidates who are successful in the ADN basic training examination may apply for enrolment in a “gases” and/or “chemicals” specialization course, to be followed by an examination. The examination shall be based on the Administrative Committee’s list of questions.
- 8.2.2.7.2.2 During the examination the candidate shall furnish proof that, in accordance with the “gases” and/or “chemicals” specialization course, he has the knowledge, understanding and capabilities required of the expert on board vessels carrying gases or chemicals, respectively.
- 8.2.2.7.2.3 The Administrative Committee shall prepare a list of questions for the examination, comprising the objectives set out in 8.2.2.3.3.1 or 8.2.2.3.3.2. The examination questions shall be selected from the list. The candidate shall not have advance knowledge of the questions selected.
- 8.2.2.7.2.4 The model attached to the list of questions is to be used to compile the examination questions.
- 8.2.2.7.2.5 The examination shall be written.

The candidate is to be asked 30 multiple-choice questions and one substantive question. The examination shall last a total of 150 minutes, of which 60 minutes for the multiple-choice questions and 90 minutes for the substantive questions.

The examination shall be marked out of a total of 60, of which 30 marks will go to the multiple-choice questions (one mark per question) and 30 to the substantive question (the distribution of marks is left to the appreciation of the competent authority). A total of 44 marks must be achieved to pass. However, not less than 20 marks must be obtained in each subject. If the candidate obtains 44 but does not achieve 20 in one subject, the subject in question may be set in a resit.

The texts of regulations and technical literature are permitted during the examination.

8.2.2.8 *ADN specialized knowledge certificate*

The issue and renewal of the ADN specialized knowledge certificate conforming to 8.6.2, shall be the responsibility of the competent authority or a body authorized by the competent authority.

Certificates shall be issued to:

- candidates who have attended a basic or specialized training course and have passed the examination;
- candidates who have taken part in a refresher or advanced training course.

Candidates who have obtained the 'gases' and/or 'chemicals' specialized training certificate shall be issued with a new certificate containing all the certificates relating to the basic and specialized training courses. The validity of the new certificate shall be five years as from the date of the basic training examination.

If the refresher and advanced training course was not fully completed before the expiry of the period of validity of the certificate, a new certificate shall not be issued until the candidate has completed a further initial basic training course and passed an examination referred to in 8.2.2.7 above.

If a new certificate is issued following attendance at a specialized or refresher and advanced training course, and the previous certificate was issued by another competent authority or by a body authorized by another competent authority, the previous certificate shall be retained and returned to the authority or body that issued it.

CHAPTER 8.3**MISCELLANEOUS REQUIREMENTS TO BE COMPLIED WITH
BY THE CREW OF THE VESSEL****8.3.1 Persons authorized on board**

8.3.1.1 Only the following persons are authorized to be on board:

- (a) members of the crew;
- (b) persons who, although not being members of the crew, normally live on board; and
- (c) persons who are on board for official reasons.

8.3.1.2 The persons referred to in 8.3.1.1 (b) are not authorized to remain in the protected area of dry cargo vessels or in the cargo area of tank vessels except for short periods.

8.3.1.3 When the vessel is required to carry two blue cones or two blue lights in accordance with column (19) of Table C of Chapter 3.2, persons under 14 years of age are not permitted on board.

8.3.2 Portable lamps

On board dry cargo vessels, the only portable lamps permitted in the protected area are lamps having their own source of power.

On board tank vessels, the only portable lamps permitted in the cargo area and on the deck outside the cargo area are lamps having their own source of power.

They shall be of the certified safe type.

8.3.3 Admittance on board

No unauthorized person shall be permitted on board. This prohibition shall be displayed on notice boards at appropriate places.

8.3.4 Prohibition on smoking, fire and naked light

Smoking on board the vessel is prohibited. This prohibition shall be displayed on notice boards at appropriate places.

This prohibition does not apply to the accommodation or the wheelhouse provided their windows, doors, skylights and hatches are closed.

8.3.5 Danger caused by work on board

No repair or maintenance work requiring the use of an open flame or electric current or liable to cause sparks may be carried out

- on board dry cargo vessels in the protected area or on the deck less than 3m forward or aft of that area;
- on board tank vessels.

This requirement does not apply:

when dry cargo vessels are furnished with an authorization from the competent authority or a certificate attesting to the totally gas-free condition of the protected area;

when tank vessels are furnished with an authorization from the competent authority or a certificate attesting to the totally gas-free condition of the vessel;

- to berthing operations.

Such work on board tank vessels may be undertaken without permission in the service spaces outside the cargo area, provided the doors and openings are closed and the vessel is not being loaded, unloaded or gas-freed.

The use of chromium vanadium steel screwdrivers and wrenches or screwdrivers and wrenches of equivalent material from the point of view of spark formation is permitted.

CHAPTER 8.4

(Reserved)

CHAPTER 8.5

(Reserved)

CHAPTER 8.6

DOCUMENTS

8.6.1 Certificate of approval

8.6.1.1 Model for a certificate of approval for dry cargo vessels

Competent authority:		1
Space reserved for the emblem and name of the State		
ADN certificate of approval No.:		
1.	Name of vessel	
2.	Official number	
3.	Type of vessel	
4.	Additional requirements:	vessel referred to in 7.1.2.19.1 ¹ vessel referred to in 7.2.2.19.3 ¹ The vessel complies with the additional rules of construction referred to in 9.1.0.80 to 9.1.0.95/ 9.2.0.80 to 9.2.0.95 for double hull vessels ¹
5.	Permitted derogations ¹ :
6.	The validity of this certificate of approval expires on	(date)
7.	The previous certificate of approval No. was issued on	by (competent authority)
8.	The vessel is approved for the carriage of dangerous goods following:	
	- inspection on ¹	(date)
	- certification by a recognized classification society ¹	
	Name of the classification society ¹	(date)
9.	Subject to permitted equivalence: ¹
10.	Subject to special authorizations: ¹
11.	Issued at:	on (date)
	(place)	
12.	(Stamp)	(competent authority)
	 (signature)

¹ Delete as appropriate

		2
Extension of the validity of the certificate of approval		
13.	The validity of this certificate is extended under Chapter 1.16 of ADN until (date)	
14. on (place) (date)	
15.	(Stamp) (competent authority)
	 (signature)

8.6.1.2 *Model for a provisional certificate of approval for dry cargo vessels*

Competent authority:	1
Space reserved for the emblem and name of the State	
ADN provisional certificate of approval No:	
1. Name of vessel	
2. Official number	
3. Type of vessel	
4. Additional requirements:	
	vessel referred to in 7.1.2.19.1 ¹
	vessel referred to in 7.2.2.19.3 ¹
	The vessel complies with the additional rules of construction referred to in 9.1.0.80 to 9.1.0.95/9.2.0.80. to 9.2.0.95 for double hull vessels ¹
5. Permitted derogations ¹ :	

6. The provisional certificate of approval is valid.....	
6.1 until	1
6.2 for a single journey from to	1
7. Issued at on	
(place)	(date)
8. (Stamp)	
	(competent authority)

	(signature)
.....	
¹ Delete as appropriate.	

NOTE: *This model provisional certificate of approval may be replaced by a single certificate model combining a provisional certificate of inspection and the provisional certificate of approval, provided that this single certificate model contains the same particulars as the model above and is approved by the competent authorities.*

8.6.1.3 Model for a certificate of approval for tank vessels

1

Competent authority:
 Space reserved for the emblem and name of the State

ADN certificate of approval No.:

1. Name of vessel
2. Official number
3. Type of vessel
4. Type of tank vessel
5. Cargo tank designs
 1. Pressure cargo tanks^{1 2}
 2. Closed cargo tanks^{1 2}
 3. Open cargo tanks with flame arresters^{1 2}
 4. Open cargo tanks^{1 2}
6. Types of cargo tanks
 1. Independent cargo tanks^{1 2}
 2. Integral cargo tanks^{1 2}
 3. Cargo tank wall distinct from the hull^{1 2}
7. Opening pressure of high-velocity vent valves/safety valves kPa^{1 2}
8. Additional equipment:
 - Sampling device
 - closed yes/no^{1 2}
 - partly closed yes/no^{1 2}
 - sampling opening yes/no^{1 2}
 - Water-spray system yes/no^{1 2}
 - Internal pressure alarm 40 kPa yes/no^{1 2}
 - Cargo heating system:
 - possibility of cargo heating from shore yes/no^{1 2}
 - cargo heating installation on board yes/no^{1 2}
 - Cargo refrigeration system yes/no^{1 2}
 - Cargo pump-room below deck yes/no¹
 - Pressure relief device yes/no^{1 2} in
 - Gas supply/return line according to
 piping and installation heated yes/no^{1 2}
 - Conforms to the rules of construction resulting from the remark(s) of column (20) of
 Table C of Chapter 3.2^{1 2}
9. Electrical equipment:
 - Temperature class:
 - Explosion group:
10. Loading rate: m³/h¹ or see loading instructions¹

¹ Delete as appropriate.

² If the tanks are not all of the same condition, see page 3.

2

11. Permitted mass density:
12. Additional observations ¹.....
.....
13. The validity of this certificate of approval expires on (date)
14. The previous certificate of approval No. was issued on
by (competent authority)
15. The vessel is approved for the carriage of dangerous goods listed in the attestation
attached to this certificate following:
- inspection on¹ (date).....
- certification by a recognized classification society¹
- Name of the classification society¹..... (date)
16. Subjected to permitted equivalence:¹
.....
.....
17. Subject to special authorizations:¹
.....
.....
18. Issued at: on
(place) (date)
19. (Stamp)
(competent authority)
.....
(signature)

¹ Delete as appropriate

Extension of the validity of the certificate of approval

20. The validity of this certificate is extended under Chapter 1.16 of ADN
Until
(date)
21. on
(place) (date)
22. (Stamp)
(competent authority)
.....
(signature)

8.6.1.4 *Model for a provisional certificate of approval for tank vessels*

Competent authority: Space reserved for the emblem and name of the State ADN provisional certificate of approval No: 1. Name of vessel 2. Official number 3. Type of vessel 4. Type of tank vessel 5. Cargo tank designs <table style="margin-left: 20px; border: none;"> <tr> <td style="width: 100px;">1. Pressure cargo tanks</td> <td style="text-align: right;">1²</td> </tr> <tr> <td>2. Closed cargo tanks</td> <td style="text-align: right;">1²</td> </tr> <tr> <td>3. Open cargo tanks with flame arresters</td> <td style="text-align: right;">1²</td> </tr> <tr> <td>4. Open cargo tanks</td> <td style="text-align: right;">1²</td> </tr> </table> 6. Types of cargo tanks <table style="margin-left: 20px; border: none;"> <tr> <td style="width: 100px;">1. Independent cargo tanks</td> <td style="text-align: right;">1²</td> </tr> <tr> <td>2. Integral cargo tanks</td> <td style="text-align: right;">1²</td> </tr> <tr> <td>3. Cargo tank wall distinct from the hull</td> <td style="text-align: right;">1²</td> </tr> </table> 7. Opening pressure of high-velocity vent valves/safety valves kPa 1 ² 8. Additional equipment: <ul style="list-style-type: none"> • Sampling device <table style="margin-left: 20px; border: none;"> <tr> <td style="width: 100px;">closed</td> <td style="text-align: right;">yes/no¹²</td> </tr> <tr> <td>partly closed</td> <td style="text-align: right;">yes/no¹²</td> </tr> <tr> <td>sampling opening</td> <td style="text-align: right;">yes/no¹²</td> </tr> </table> • Water-spray system yes/no¹² <table style="margin-left: 20px; border: none;"> <tr> <td style="width: 100px;">Internal pressure alarm 40 kPa</td> <td style="text-align: right;">yes/no¹²</td> </tr> </table> • Cargo heating system: <table style="margin-left: 20px; border: none;"> <tr> <td style="width: 100px;">possibility of cargo heating from shore</td> <td style="text-align: right;">yes/no¹²</td> </tr> <tr> <td>cargo heating installation on board</td> <td style="text-align: right;">yes/no¹²</td> </tr> </table> • cargo refrigeration system yes/no¹² • cargo pump-room below deck yes/no¹ • Pressure relief device yes/no¹² in • Gas supply/return line according to piping and installation heated yes/no¹² • Conforms to the rules of construction resulting from the remark(s) of column (20) of Table C of Chapter 3.2¹² 9. Electrical equipment: <ul style="list-style-type: none"> • Temperature class: • Explosion group: 10. Loading rate m ³ /h ¹ or see loading instructions ¹	1. Pressure cargo tanks	1 ²	2. Closed cargo tanks	1 ²	3. Open cargo tanks with flame arresters	1 ²	4. Open cargo tanks	1 ²	1. Independent cargo tanks	1 ²	2. Integral cargo tanks	1 ²	3. Cargo tank wall distinct from the hull	1 ²	closed	yes/no ¹²	partly closed	yes/no ¹²	sampling opening	yes/no ¹²	Internal pressure alarm 40 kPa	yes/no ¹²	possibility of cargo heating from shore	yes/no ¹²	cargo heating installation on board	yes/no ¹²	1
1. Pressure cargo tanks	1 ²																										
2. Closed cargo tanks	1 ²																										
3. Open cargo tanks with flame arresters	1 ²																										
4. Open cargo tanks	1 ²																										
1. Independent cargo tanks	1 ²																										
2. Integral cargo tanks	1 ²																										
3. Cargo tank wall distinct from the hull	1 ²																										
closed	yes/no ¹²																										
partly closed	yes/no ¹²																										
sampling opening	yes/no ¹²																										
Internal pressure alarm 40 kPa	yes/no ¹²																										
possibility of cargo heating from shore	yes/no ¹²																										
cargo heating installation on board	yes/no ¹²																										

¹ Delete as appropriate.

² If the tanks are not all of the same type, see page 3

11. Permitted mass density:
12. Additionnal observations:¹
13. The provisional certificate of approval is valid.....
- 13.1 until ¹.....
- 13.2 for a single journey from ¹..... to
14. Issued at on
- (place) (date)
15. (Stamp)
- (competent authority)
-
- (signature)

¹ Delete as appropriate.

NOTE: This model provisional certificate of approval may be replaced by a single certificate model combining a provisional certificate of inspection and the provisional certificate of approval, provided that this single certificate model contains the same particulars as the model above and is approved by the competent authorities.

8.6.2 Certificate of special knowledge of ADN according to 8.2.1.3, 8.2.1.5 or 8.2.1.7

(Format: A6, Colour: orange)

(Space reserved for the emblem of State,
competent authority)

ADN certificate

of special knowledge of ADN

No. of certificate:

Name
First name(s):

Born on:

Nationality:

Signature of holder:

The holder of this certificate has special knowledge of
ADN

The certificate is valid for special knowledge of ADN
according to
8.2.1.3 (dry cargo vessels)*
8.2.1.3 (tanks vessels)*
8.2.1.5*
8.2.1.7*

until:

Issued by:

Date:

(Stamp)

Signature:

* Delete as appropriate.

(Recto)

(Verso)

8.6.3 Checklist ADN

1

Checklist ADN

concerning the observance of safety provisions and the implementation of the necessary measures for loading/unloading

- **Particulars of vessel**

..... No.
 (name of vessel) (official number)

.....
 (vessel type)

- **Particulars of loading or unloading operations**

.....
 (shore loading or unloading installation) (place)

.....
 (date) (time)

- **Particulars of the cargo**

Quantity m ³	Name of product	Identification number	Class
.....
.....
.....

- **Particulars of last cargo***

Name of product	Identification number	Class
.....
.....
.....

* To be filled in only if vessel is to be loaded.

2							
Loading/unloading rate (not to be filled in if vessel is to be loaded with gas)							
Name of substance	Cargo tank number	agreed rate of loading/unloading					
		start		half way		end	
		rate m ³ /h	quantity m ³	rate m ³ /h	quantity m ³	rate m ³ /h	quantity m ³
.....
.....
.....

Will the cargo piping be drained after loading or unloading by stripping or by blowing residual quantities to the shore installation/to the vessel?*

by blowing*
by stripping*

If drained by blowing, how?

.....

(e.g. air, inert gas, sleeve)

..... kPa
(permissible maximum pressure in the cargo tank)

..... litres
(estimated residual quantity)

Questions to the master or the person mandated by him and the person in charge at the loading/unloading place

Loading/unloading may only be started after all questions on the checklist have been checked off by “X”, i.e. answered with YES and the list has been signed by both persons.

Non-applicable questions have to be deleted.

If not all questions can be answered with YES, loading/unloading is only allowed with consent of the competent authority.

* Delete as appropriate.

	vessel	3 loading/ unloading place
1. Is the vessel permitted to carry this cargo?	O*	O*
2. <i>(Reserved)</i>		
3. Is the vessel well moored in view of local circumstances?	O	–
4. Have suitable means been provided at the fore and at the aft of the vessel, for boarding or leaving, including in cases of emergency?	O	O
5. Are the escape routes and the loading/unloading place adequately lighted?	O	O
6. Vessel/shore connection		
6.1 Are the cargo hoses between vessel and shore in satisfactory condition?	–	O
Are these hoses correctly connected?	–	O
6.2 Are all the connecting flanges fitted with suitable gaskets?	–	O
6.3 Are all the connecting bolts fitted and tightened?	O	O
6.4 Are the shoreside loading arms free to move in all directions and do the hoses have enough room for easy movement?	–	O
7. Are all flanges of the connections of the pipes for loading and unloading and of the vapour pipe not in use, correctly blanked off?	O	O
8. Are suitable means of collecting leakages placed under the pipe connections which are in use?	O	O
9. Are the movable connecting pieces between the ballast and bilge piping on the one hand and the pipes for loading and unloading on the other hand disconnected?	O	-
10. Is continuous and suitable supervision of loading/unloading ensured for the whole period of the operation?	O	O
11. Is communication between vessel and shore ensured?	O	O

* To be filled in only if vessel is to be loaded.

		vessel	loading/ unloading place	4
12.1	For the loading of the vessel, is the vapour pipe, where required, or if it exists, connected with the shore gas return line?	O	O	
12.2	Is it ensured that the shore installation is such that the pressure at the connecting point cannot exceed the opening pressure of the high-velocity vent valves?	–	O*	
12.3	When anti-explosion protection is required in Chapter 3.2, Table C, column (17) does the shore installation ensure that its venting pipe or pressure compensation pipe is such that the vessel is protected against detonations and flame fronts from the shore.	–	O	
13.	Is it know what actions are to be taken in the event of an “Emergency-stop” and an “Alarm”?	O	O	
14.	Check on the most important operational requirements: <ul style="list-style-type: none"> – Are the required fire extinguishing systems and appliances operational? – Have all valves and other closing devices been checked for correct open - or closed position? – Has smoking been generally prohibited? – Are the flame-operated heating, cooking and cooling applications on board turned off? – Are the liquefied gas installations shut off at the main check valve? – Is the voltage cut off from the radar installations? – Is all electrical equipment marked red switched off? – Are all windows and doors closed? 	O O O O O O O O	O O O – – – –	
15.1	Has the starting working pressure of the vessels cargo discharge pump been adjusted to the permissible working pressure of the shore installation?	O	–	
15.2	Has the starting working pressure of the shore pump been adjusted to the permissible working pressure of the on board installation?	–	O	
16.	Is the liquid level alarm-installation operational?	O	–	

		vessel	loading/ unloading place	5
17.	Is the following system plugged in, in working order and tested? Overflow prevention device (only when loading the vessel) Device for switching off the on-board pump from the shore facility (only when unloading the vessel)	 O O	 O O	
18.	To be filled in only in the case of loading or unloading of substances for the carriage of which a vessel of the closed type or a vessel of the open type with flame arrester is required. Are the cargo tank hatches and cargo tank inspection, gauging and sampling openings closed or protected by flame arresters in good condition?	 O	 –	
Checked, filled in and signed				
for the vessel:		for the installation of loading and unloading		
.....			
name (in capital letters)		name (in capital letters)		
.....			
(signature)		(signature)		

Explanation**Question 3**

“Well moored” means that the vessel is fastened to the pier or the cargo transfer station in such a way that, without intervention of a third person, movements of the vessel in any direction that could hamper the operation of the cargo transfer gear will be prevented. Established or predictable variations of the water-level at that location and special factors have to be taken into account.

Question 4

It must be possible to board or escape from the vessel at any time. If there is none or only one protected escape route available at the shoreside for a quick escape from the vessel in case of emergency, a suitable means of escape has to be provided on the vessel side (e.g. a lowered dinghy).

Question 6

A valid inspection certificate for the loading/unloading hoses must be available on board. The material of the hoses must be able to withstand the expected loads and be suitable for cargo transfer of the respective substances. The term cargo hoses includes hoses as well as the shoreside loading/discharging arms. The cargo transfer hoses between vessel and shore must be placed so that they cannot be damaged by variations of the water-level, passing vessels and/or loading/unloading operations. All flange connections are to be fitted with appropriate gaskets and sufficient bolt connections in order to exclude the possibility of leakage.

Question 10

Loading/unloading must be supervised on board and ashore so that dangers which may occur in the vicinity of cargo hoses can be recognized immediately. When supervision is effected by additional technical means it must be agreed between the shore installation and the vessel how it is to be ensured.

Question 11

For a safe loading/unloading operation good communications between vessel and shore are required. For this purpose telephone and radio equipment may be used only if of an explosion protected type and located within reach of the supervisor.

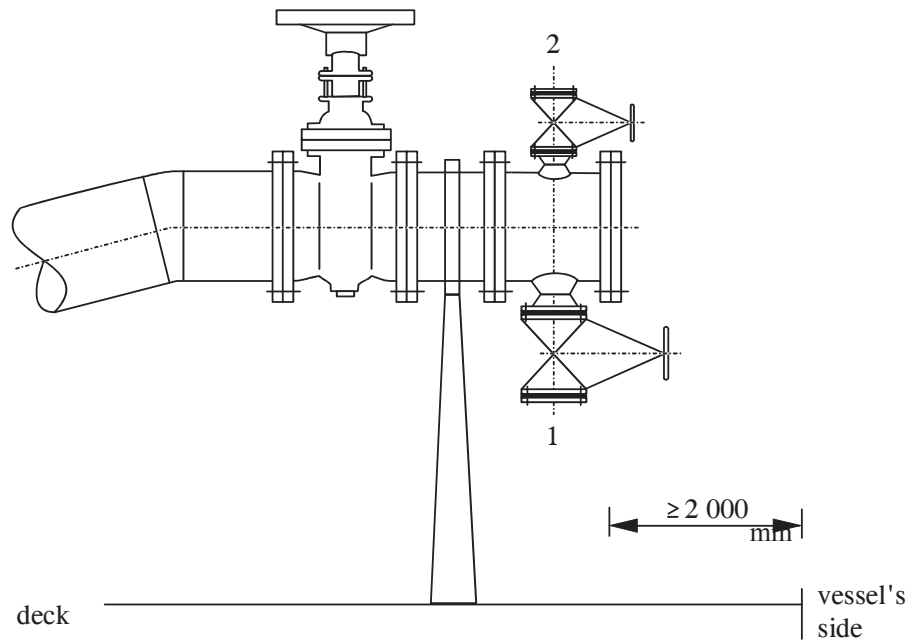
Question 13

Before the start of the loading/unloading operation the representative of the shore installation and the master or the person mandated by him must agree on the applicable procedure. The specific properties of the substances to be loaded/unloaded have to be taken into account.

8.6.4 Discharge of residual quantities and stripping systems

NOTE: It is not necessary to apply this section. The date of application will be defined later.

8.6.4.1 Device for the discharge of residual quantities



1. Connection for the discharge of residual quantities
2. Connection of the shore installation intended for blowing residual quantities to the short installation by means of a gas

8.6.4.2 *Test of the stripping system*

8.6.4.2.1 Before the start of the test, the cargo tanks and their piping shall be clean. The cargo tanks shall be safe for entry.

8.6.4.2.2 During the test, the trim and list of the vessel shall not exceed normal operating values.

8.6.4.2.3 During the test, a back pressure of not less than 300 kPa (3 bar) shall be maintained at the device for discharge of residual quantities fitted on the pipe for unloading.

8.6.4.2.4 The test shall comprise :

- (a) The filling of the cargo tank with water until the suction intake inside the tank is submerged;
- (b) The pumping out of the water and the emptying of the cargo tank and the corresponding piping by means of the tank's stripping system;
- (c) The collection of the remaining water at the following points:
 - The cargo tank suction intake;
 - The bottom of the cargo tank where water has collected;
 - The lowest point drain of the cargo pump;
 - At all the lowest points of the piping associated with the cargo tank up to the device for the discharge of residual quantities.

8.6.4.2.5 The quantity of water collected as described in 8.6.4.2.4 (c) shall be measured precisely and noted in the test certificate referred to in 8.6.4.3.

8.6.4.2.6 The competent authority or the recognized classification society shall set out all the operations required for the test in the test certificate.

This certificate shall include at least the following data:

- trim of the vessel during the test;
- list of the vessel during the test;
- tank unloading order;
- back pressure at the device for the discharge of residual quantities;
- residual quantity per tank;
- residual quantity per piping system;
- duration of the stripping operation;
- cargo tank plan, duly completed.

8.6.4.3 *Certificate for the test of the stripping system*

Certificate for the test of the stripping system

1. Name of vessel:

2. Official number:

3. Type of tank vessel:

4. Number of certificate of approval:

5. Date of test:

6. Place of test:

7. Number of cargo tanks:

8. The following residual quantities were measured during the test

Cargo tank 1:litres	Cargo tank 2:litres
Cargo tank 3:litres	Cargo tank 4:litres
Cargo tank 5:litres	Cargo tank 6:litres
Cargo tank 7:litres	Cargo tank 8:litres
Cargo tank 9:litres	Cargo tank 10:litres
Cargo tank 11:litres	Cargo tank 12:litres
Slop tank 1:litres	Slop tank 2:litres
Slop tank 3:litres	
Piping system 1:litres	
Piping system 2:litres	

9. During the test, the back pressure at the device for the discharge of residual quantities waskPa.

10. The cargo tanks were discharged in the following order:

tank...,	tank...,	tank...,	tank...,	tank...,
tank...,	tank...,	tank...,	tank...,	tank...,

11. During the test, the trim of the vessel wasm
and the list of the vessel wasm

12. The total duration of the stripping operation was..... h.

.....
(date) (signature)

PART 9

Rules for construction

CHAPTER 9.1

RULES FOR CONSTRUCTION OF DRY CARGO VESSELS

9.1.0 Rules for construction applicable to dry cargo vessels

Provisions of 9.1.0.0 to 9.1.0.79 apply to dry cargo vessels.

9.1.0.0 *Materials of construction*

The vessel's hull shall be constructed of shipbuilding steel or other metal, provided that this metal has at least equivalent mechanical properties and resistance to the effects of temperature and fire.

9.1.0.1-
9.1.0.10 *(Reserved)*

9.1.0.11 Holds

9.1.0.11.1 (a) Each hold shall be bounded fore and aft by watertight metal bulkheads.

(b) The holds shall have no common bulkhead with the oil fuel tanks.

9.1.0.11.2 The bottom of the holds shall be such as to permit them to be cleaned and dried.

9.1.0.11.3 The hatchway covers shall be spraytight and weathertight or be covered by waterproof tarpaulins.

Tarpaulins used to cover the holds shall not readily ignite.

9.1.0.11.4 No heating appliances shall be installed in the holds.

9.1.0.12 *Ventilation*

9.1.0.12.1 Ventilation of each hold shall be provided by means of two mutually independent extraction ventilators having a capacity of not less than five changes of air per hour based on the volume of the empty hold. The ventilator fan shall be designed so that no sparks may be emitted on contact of the impeller blades with the housing and no static electricity may be generated. The extraction ducts shall be positioned at the extreme ends of the hold and extend down to not more than 50 mm above the bottom. The extraction of gases and vapours through the duct shall also be ensured for carriage in bulk.

If the extraction ducts are movable they shall be suitable for the ventilator assembly and capable of being firmly fixed. Protection shall be ensured against bad weather and spray. The air intake shall be ensured during ventilation.

9.1.0.12.2 The ventilation system of a hold shall be arranged so that dangerous gases cannot penetrate into the accommodation, wheelhouse or engine rooms.

9.1.0.12.3 Ventilation shall be provided for the accommodation and for service spaces.

9.1.0.13-
9.1.0.16 *(Reserved)*

9.1.0.17 *Accommodation and service spaces*

9.1.0.17.1 The accommodation shall be separated from the holds by metal bulkheads having no openings.

9.1.0.17.2 Gastight closing appliances shall be provided for openings in the accommodation and wheelhouse facing the holds.

9.1.0.17.3 No entrances or openings of the engine rooms and service spaces shall face the protected area.

9.1.0.18-
9.1.0.19 (*Reserved*)

9.1.0.20 *Water ballast*

The double-hull spaces and double bottoms may be arranged for being filled with water ballast.

9.1.0.21-
9.1.0.30 (*Reserved*)

9.1.0.31 *Engines*

9.1.0.31.1 Only internal combustion engines running on fuel having a flashpoint above 55 °C are allowed.

9.1.0.31.2 The air vents in the engine rooms and the air intakes of the engines which do not take air in directly from the engine room shall be located not less than 2.00 m from the protected area.

9.1.0.31.3 Sparking shall not be possible in the protected area.

9.1.0.32 *Oil fuel tanks*

9.1.0.32.1 Double bottoms within the hold area may be arranged as oil fuel tanks provided their depth is not less than 0.6 m. Oil fuel pipes and openings to such tanks are not permitted in the holds.

9.1.0.32.2 The air pipes of all oil fuel tanks shall be led to 0.50 m above the open deck. Their open ends and the open ends of the overflow pipes leading to the deck shall be fitted with a protective device consisting of a gauze grid or by a perforated plate.

9.1.0.33 (*Reserved*)

9.1.0.34 *Exhaust pipes*

9.1.0.34.1 Exhausts shall be evacuated from the vessel into the open air either upwards through an exhaust pipe or through the shell plating. The exhaust outlet shall be located not less than 2.00 m from the hatchway openings. The exhaust pipes of engines shall be arranged so that the exhausts are led away from the vessel. The exhaust pipes shall not be located within the protected area.

9.1.0.34.2 Exhaust pipes shall be provided with a device preventing the escape of sparks, e.g. spark arresters.

9.1.0.35 *Stripping installation*

The stripping pumps intended for the holds shall be located in the protected area. This requirement shall not apply when stripping is effected by eductors.

9.1.0.36-
9.1.0.39 (*Reserved*)

9.1.0.40 *Fire-extinguishing arrangements*

9.1.0.40.1 A fire-extinguishing system shall be installed on the vessel. This system shall comply with the following requirements:

- It shall be supplied by two independent fire or ballast pumps one of which shall be ready for use at any time. These pumps and their means of propulsion and electrical equipment shall not be installed in the same space;
- It shall be provided with a water main fitted with at least three hydrants in the protected area above deck. Three suitable and sufficiently long hoses with spray nozzles having a diameter of not less than 12 mm shall be provided. It shall be possible to reach any point of the deck in the protected area simultaneously with at least two jets of water which do not emanate from the same hydrant. A spring-loaded non-return valve shall be fitted to ensure that no gases can escape through the fire-extinguishing system into the accommodation or service spaces outside the protected area;
- The capacity of the system shall be at least sufficient for a jet of water to reach a distance of not less than the vessel's breadth from any location on board with two spray nozzles being used at the same time.

A single fire or ballast pump shall suffice on board pushed barges without their own means of propulsion.

9.1.0.40.2 In addition, the engine rooms shall be provided with a permanently fixed fire-extinguishing system meeting the following requirements:

9.1.0.40.2.1 *Extinguishing agents*

For the protection of spaces in engine rooms, boiler rooms and pump rooms, only permanently fixed fire-extinguishing systems using the following extinguishing agents are permitted:

- (a) CO₂ (carbon dioxide);
- (b) HFC 227 ea (heptafluoropropane);
- (c) IG-541 (52% nitrogen, 40% argon, 8% carbon dioxide);
- (d) FK-5-1-12 (dodecafluoro 2-methylpentane-3-one).

Other extinguishing agents are permitted only on the basis of recommendations by the Administrative Committee.

9.1.0.40.2.2 *Ventilation, air extraction*

- (a) The combustion air required by the combustion engines which ensure propulsion should not come from spaces protected by permanently fixed fire-extinguishing systems. This requirement is not mandatory if the vessel has two independent main engine rooms with a gastight separation or if, in addition to the main engine room, there is a separate engine room installed with a bow thruster that can independently ensure propulsion in the event of a fire in the main engine room.
- (b) All forced ventilation systems in the space to be protected shall be shut down automatically as soon as the fire-extinguishing system is activated.
- (c) All openings in the space to be protected which permit air to enter or gas to escape shall be fitted with devices enabling them to be closed rapidly. It shall be clear whether they are open or closed.
- (d) Air escaping from the pressure-relief valves of the pressurised air tanks installed in the engine rooms shall be evacuated to the open air.
- (e) Overpressure or negative pressure caused by the diffusion of the extinguishing agent shall not destroy the constituent elements of the space to be protected. It shall be possible to ensure the safe equalisation of pressure.
- (f) Protected spaces shall be provided with a means of extracting the extinguishing agent. If extraction devices are installed, it shall not be possible to start them up during extinguishing.

9.1.0.40.2.3 *Fire alarm system*

The space to be protected shall be monitored by an appropriate fire alarm system. The alarm signal shall be audible in the wheelhouse, the accommodation and the space to be protected.

9.1.0.40.2.4 *Piping system*

- (a) The extinguishing agent shall be routed to and distributed in the space to be protected by means of a permanent piping system. Piping installed in the space to be protected and the reinforcements it incorporates shall be made of steel. This shall not apply to the connecting nozzles of tanks and compensators provided that the materials used have equivalent fire-retardant properties. Piping shall be protected against corrosion both internally and externally.
- (b) The discharge nozzles shall be so arranged as to ensure the regular diffusion of the extinguishing agent. In particular, the extinguishing agent must also be effective beneath the floor.

9.1.0.40.2.5 *Triggering device*

- (a) Automatically activated fire-extinguishing systems are not permitted.
- (b) It shall be possible to activate the fire-extinguishing system from a suitable point located outside the space to be protected.
- (c) Triggering devices shall be so installed that they can be activated in the event of a fire and so that the risk of their breakdown in the event of a fire or an explosion in the space to be protected is reduced as far as possible.

Systems which are not mechanically activated shall be supplied from two energy sources independent of each other. These energy sources shall be located outside the space to be protected. The control lines located in the space to be protected shall be so designed as to remain capable of operating in the event of a fire for a minimum of 30 minutes. The electrical installations are deemed to meet this requirement if they conform to the IEC 60331-21:1999 standard.

When the triggering devices are so placed as not to be visible, the component concealing them shall carry the "Fire-fighting system" symbol, each side being not less than 10 cm in length, with the following text in red letters on a white ground:

Fire-extinguishing system

- (d) If the fire-extinguishing system is intended to protect several spaces, it shall comprise a separate and clearly-marked triggering device for each space;
- (e) The instructions shall be posted alongside all triggering devices and shall be clearly visible and indelible. The instructions shall be in a language the master can read and understand and if this language is not English, French or German, they shall be in English, French or German. They shall include information concerning:
 - (i) the activation of the fire-extinguishing system;
 - (ii) the need to ensure that all persons have left the space to be protected;
 - (iii) The correct behaviour of the crew in the event of activation and when accessing the space to be protected following activation or diffusion, in particular in respect of the possible presence of toxic substances;
 - (iv) the correct behaviour of the crew in the event of the failure of the fire-extinguishing system to function properly.
- (f) The instructions shall mention that prior to the activation of the fire-extinguishing system, combustion engines installed in the space and aspirating air from the space to be protected, shall be shut down.

9.1.0.40.2.6 *Alarm device*

- (a) Permanently fixed fire-extinguishing systems shall be fitted with an audible and visual alarm device;
- (b) The alarm device shall be set off automatically as soon as the fire-extinguishing system is first activated. The alarm device shall function for an appropriate period of time before the extinguishing agent is released; it shall not be possible to turn it off;
- (c) Alarm signals shall be clearly visible in the spaces to be protected and their access points and be clearly audible under operating conditions corresponding to the highest possible sound level. It shall be possible to distinguish them clearly from all other sound and visual signals in the space to be protected;
- (d) Sound alarms shall also be clearly audible in adjoining spaces, with the communicating doors shut, and under operating conditions corresponding to the highest possible sound level;
- (e) If the alarm device is not intrinsically protected against short circuits, broken wires and drops in voltage, it shall be possible to monitor its operation;

- (f) A sign with the following text in red letters on a white ground shall be clearly posted at the entrance to any space the extinguishing agent may reach:

Warning, fire-extinguishing system!
Leave this space immediately when the ... (description) alarm is activated!

9.1.0.40.2.7 *Pressurised tanks, fittings and piping*

- (a) Pressurised tanks, fittings and piping shall conform to the requirements of the competent authority.
- (b) Pressurised tanks shall be installed in accordance with the manufacturer's instructions.
- (c) Pressurised tanks, fittings and piping shall not be installed in the accommodation.
- (d) The temperature of cabinets and storage spaces for pressurised tanks shall not exceed 50 °C.
- (e) Cabinets or storage spaces on deck shall be securely stowed and shall have vents so placed that in the event of a pressurised tank not being gastight, the escaping gas cannot penetrate into the vessel. Direct connections with other spaces are not permitted.

9.1.0.40.2.8 *Quantity of extinguishing agent*

If the quantity of extinguishing agent is intended for more than one space, the quantity of extinguishing agent available does not need to be greater than the quantity required for the largest of the spaces thus protected.

9.1.0.40.2.9 *Installation, maintenance, monitoring and documents*

- (a) The mounting or modification of the system shall only be performed by a company specialised in fire-extinguishing systems. The instructions (product data sheet, safety data sheet) provided by the manufacturer of the extinguishing agent or the system shall be followed.
- (b) The system shall be inspected by an expert:
- (i) before being brought into service;
 - (ii) each time it is put back into service after activation;
 - (iii) after every modification or repair;
 - (iv) regularly, not less than every two years.
- (c) During the inspection, the expert is required to check that the system conforms to the requirements of 9.1.0.40.2.
- (d) The inspection shall include, as a minimum:
- (i) an external inspection of the entire system;
 - (ii) an inspection to ensure that the piping is leakproof;

- (iii) an inspection to ensure that the control and activation systems are in good working order;
 - (iv) an inspection of the pressure and contents of tanks;
 - (v) an inspection to ensure that the means of closing the space to be protected are leakproof;
 - (vi) an inspection of the fire alarm system;
 - (vii) an inspection of the alarm device.
- (e) The person performing the inspection shall establish, sign and date a certificate of inspection.
 - (f) The number of permanently fixed fire-extinguishing systems shall be mentioned in the inspection certificate.

9.1.0.40.2.10 *Fire-extinguishing system operating with CO₂*

In addition to the requirements contained in 9.1.0.40.2.1 to 9.1.0.40.2.9, fire-extinguishing systems using CO₂ as an extinguishing agent shall conform to the following provisions:

- (a) Tanks of CO₂ shall be placed in a gastight space or cabinet separated from other spaces. The doors of such storage spaces and cabinets shall open outwards; they shall be capable of being locked and shall carry on the outside the symbol "Warning: general danger," not less than 5 cm high and "CO₂" in the same colours and the same size;
- (b) Storage cabinets or spaces for CO₂ tanks located below deck shall only be accessible from the outside. These spaces shall have an artificial ventilation system with extractor hoods and shall be completely independent of the other ventilation systems on board;
- (c) The level of filling of CO₂ tanks shall not exceed 0.75 kg/l. The volume of depressurised CO₂ shall be taken to be 0.56 m³/kg;
- (d) The concentration of CO₂ in the space to be protected shall be not less than 40% of the gross volume of the space. This quantity shall be released within 120 seconds. It shall be possible to monitor whether diffusion is proceeding correctly;
- (e) The opening of the tank valves and the control of the diffusing valve shall correspond to two different operations;
- (f) The appropriate period of time mentioned in 9.1.0.40.2.6 (b) shall be not less than 20 seconds. A reliable installation shall ensure the timing of the diffusion of CO₂.

9.1.0.40.2.11 *Fire-extinguishing system operating with HFC-227 ea (heptafluoropropane)*

In addition to the requirements of 9.1.0.40.2.1 to 9.1.0.40.2.9, fire-extinguishing systems using HFC-227 ea as an extinguishing agent shall conform to the following provisions:

- (a) Where there are several spaces with different gross volumes, each space shall be equipped with its own fire-extinguishing system;

- (b) Every tank containing HFC-227 ea placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of the tank are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;
- (c) Every tank shall be fitted with a device permitting control of the gas pressure;
- (d) The level of filling of tanks shall not exceed 1.15 kg/l. The specific volume of depressurised HFC-227 ea shall be taken to be 0.1374 m³/kg;
- (e) The concentration of HFC-227 ea in the space to be protected shall be not less than 8% of the gross volume of the space. This quantity shall be released within 10 seconds;
- (f) Tanks of HFC-227 ea shall be fitted with a pressure monitoring device which triggers an audible and visual alarm in the wheelhouse in the event of an unscheduled loss of propellant gas. Where there is no wheelhouse, the alarm shall be triggered outside the space to be protected;
- (g) After discharge, the concentration in the space to be protected shall not exceed 10.5% (volume);
- (h) The fire-extinguishing system shall not comprise aluminium parts.

9.1.0.40.2.12 *Fire-extinguishing system operating with IG-541*

In addition to the requirements of 9.1.0.40.2.1 to 9.1.0.40.2.9, fire-extinguishing systems using IG-541 as an extinguishing agent shall conform to the following provisions:

- (a) Where there are several spaces with different gross volumes, every space shall be equipped with its own fire-extinguishing system;
- (b) Every tank containing IG-541 placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of the tank are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;
- (c) Each tank shall be fitted with a device for checking the contents;
- (d) The filling pressure of the tanks shall not exceed 200 bar at a temperature of +15 °C;
- (e) The concentration of IG-541 in the space to be protected shall be not less than 44% and not more than 50% of the gross volume of the space. This quantity shall be released within 120 seconds.

9.1.0.40.2.13 *Fire-extinguishing system operating with FK-5-1-12*

In addition to the requirements of 9.1.0.40.2.1 to 9.1.0.40.2.9, fire-extinguishing systems using FK-5-1-12 as an extinguishing agent shall comply with the following provisions:

- (a) Where there are several spaces with different gross volumes, every space shall be equipped with its own fire-extinguishing system;
- (b) Every tank containing FK-5-1-12 placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of

the tank are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;

- (c) Every tank shall be fitted with a device permitting control of the gas pressure;
- (d) The level of filling of tanks shall not exceed 1.00 kg/l. The specific volume of depressurized FK-5-1-12 shall be taken to be 0.0719 m³/kg;
- (e) The volume of FK-5-1-12 in the space to be protected shall be not less than 5.5% of the gross volume of the space. This quantity shall be released within 10 seconds;
- (f) Tanks of FK-5-1-12 shall be fitted with a pressure monitoring device which triggers an audible and visual alarm in the wheelhouse in the event of an unscheduled loss of extinguishing agent. Where there is no wheelhouse, the alarm shall be triggered outside the space to be protected;
- (g) After discharge, the concentration in the space to be protected shall not exceed 10.0%.

9.1.0.40.2.14 *Fixed fire-extinguishing system for physical protection*

In order to ensure physical protection in the engine rooms, boiler rooms and pump rooms, permanently fixed fire-extinguishing systems are accepted solely on the basis of recommendations by the Administrative Committee.

9.1.0.40.3 The two hand fire-extinguishers referred to in 8.1.4 shall be located in the protected area.

9.1.0.40.4 The fire-extinguishing agent in the permanently fixed fire-extinguishing system shall be suitable and sufficient for fighting fires.

9.1.0.41 *Fire and naked light*

9.1.0.41.1 The outlets of funnels shall be located not less than 2 m from the hatchway openings. Arrangements shall be provided to prevent the escape of sparks and the entry of water.

9.1.0.41.2 Heating, cooking and refrigerating appliances shall not be fuelled with liquid fuels, liquid gas or solid fuels. The installation in the engine room or other separate space of heating appliances fuelled with liquid fuel having a flashpoint above 55 °C is, however, permitted.

Cooking and refrigerating appliances are permitted only in wheelhouses with metal floor and in the accommodation.

9.1.0.41.3 Electric lighting appliances only are permitted outside the accommodation and the wheelhouse.

9.1.0.42-
9.1.0.51 (*Reserved*)

9.1.0.52 *Type and location of electrical equipment*

9.1.0.52.1 It shall be possible to isolate the electrical equipment in the protected area by means of centrally located switches except where:

- in the holds it is of a certified safe type corresponding at least to temperature class T4 and explosion group II B; and

- in the protected area on the deck it is of the limited explosion risk type.

The corresponding electrical circuits shall have control lamps to indicate whether or not the circuits are live.

The switches shall be protected against unintended unauthorized operation. The sockets used in this area shall be so designed as to prevent connections being made except when they are not live. Submerged pumps installed or used in the holds shall be of the certified safe type at least for temperature class T4 and explosion group II B.

9.1.0.52.2 Electric motors for hold ventilators which are arranged in the air flow shall be of the certified safe type.

9.1.0.52.3 Sockets for the connection of signal lights and gangway lighting shall be solidly fitted to the vessel close to the signal mast or the gangway. Sockets intended to supply the submerged pumps, hold ventilators and containers shall be permanently fitted to the vessel in the vicinity of the hatches.

9.1.0.52.4 Accumulators shall be located outside the protected area.

9.1.0.53-
9.1.0.55 (*Reserved*)

9.1.0.56 *Electric cables*

9.1.0.56.1 Cables and sockets in the protected area shall be protected against mechanical damage.

9.1.0.56.2 Movable cables are prohibited in the protected area, except for intrinsically safe electric circuits or for the supply of signal lights and gangway lighting, for containers, for submerged pumps, hold ventilators and for electrically operated cover gantries.

9.1.0.56.3 For movable cables permitted in accordance with 9.1.0.56.2 above, only rubber-sheathed cables of type H07 RN-F in accordance with standard IEC-60 245-4:1994 or cables of at least equivalent design having conductors with a cross-section of not less than 1.5 mm², shall be used. These cables shall be as short as possible and installed so that damage is not likely to occur.

9.1.0.57-
9.1.0.69 (*Reserved*)

9.1.0.70 *Metal wires, masts*

All metal wires passing over the holds and all masts shall be earthed, unless they are electrically bonded to the metal hull of the vessel through their installation.

9.1.0.71 *Admittance on board*

The notice boards displaying the prohibition of admittance in accordance with 8.3.3 shall be clearly legible from either side of the vessel.

9.1.0.72-
9.1.0.73 (*Reserved*)

9.1.0.74 ***Prohibition of smoking, fire and naked light***

9.1.0.74.1 The notice boards displaying the prohibition of smoking in accordance with 8.3.4 shall be clearly legible from either side of the vessel.

9.1.0.74.2 Notice boards indicating the circumstances under which the prohibition applies shall be fitted near the entrances to the spaces where smoking or the use of fire or naked light is not always prohibited.

9.1.0.74.3 Ashtrays shall be provided close to each exit of the accommodation and the wheelhouse.

9.1.0.75-
9.1.0.79 (*Reserved*)

9.1.0.80 ***Additional rules applicable to double-hull vessels***

The rules of 9.1.0.88 to 9.1.0.99 are applicable to double-hull vessels intended to carry dangerous goods of Classes 2, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 7, 8 or 9, except those for which label No. 1 is prescribed in column (5) of Table A of Chapter 3.2, in quantities exceeding those of 7.1.4.1.1.

9.1.0.81-
9.1.0.87 (*Reserved*)

9.1.0.88 ***Classification***

9.1.0.88.1 Double-hull vessels intended to carry dangerous goods of Classes 2, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 7, 8 or 9 except those for which label No. 1 is prescribed in column (5) of Table A of Chapter 3.2, in quantities exceeding those referred to in 7.1.4.1.1 shall be built or transformed under survey of a recognised classification society in accordance with the rules established by this classification society to its highest class. This shall be confirmed by the classification society by the issue of an appropriate certificate.

9.1.0.88.2 Continuation of class is not required.

9.1.0.88.3 Future conversions and major repairs to the hull shall be carried out under survey of this classification society.

9.1.0.89-
9.1.0.90 (*Reserved*)

9.1.0.91 ***Holds***

9.1.0.91.1 The vessel shall be built as a double-hull vessel with double-hull spaces and double bottom within the protected area.

9.1.0.91.2 The distance between the sides of the vessel and the longitudinal bulkheads of the hold shall be not less than 0.80 m. Regardless of the requirements relating to the width of walkways on deck, a reduction of this distance to 0.60 m is permitted, provided that, compared with the scantlings specified in the rules for construction published by a recognised classification society, the following reinforcements have been made:

- (a) Where the vessel's sides are constructed according to the longitudinal framing system, the frame spacing shall not exceed 0.60 m.

The longitudinals shall be supported by web frames with lightening holes similar to the floors in the double bottom and spaced not more than 1.80 m apart. These intervals may be increased if the construction is correspondingly reinforced;

(b) Where the vessel's sides are constructed according to the transverse framing system, either:

- two longitudinal side shell stringers shall be fitted. The distance between the two stringers and between the uppermost stringer and the gangboard shall not exceed 0.80 m. The depth of the stringers shall be at least equal to that of the transverse frames and the cross-section of the face plate shall be not less than 15 cm².

The longitudinal stringers shall be supported by web frames with lightening holes similar to plate floors in the double bottom and spaced not more than 3.60 m apart. The transverse shell frames and the hold bulkhead vertical stiffeners shall be connected at the bilge by a bracket plate with a height of not less than 0.90 m and thickness equal to the thickness of the floors; or

- web frames with lightening holes similar to the double bottom plate floors shall be arranged on each transverse frame;

(c) The gangboards shall be supported by transverse bulkheads or cross-ties spaced not more than 32 m apart.

As an alternative to compliance with the requirements of (c) above, a proof by calculation, issued by a recognised classification society confirming that additional reinforcements have been fitted in the double-hull spaces and that the vessel's transverse strength may be regarded as satisfactory.

9.1.0.91.3 The depth of the double bottom shall be at least 0.50 m. The depth below the suction wells may, however, be locally reduced, but the space between the bottom of the suction well and the bottom of the vessel floor shall be at least 0.40 m. If spaces are between 0.40 m and 0.49 m, the surface area of the suction well shall not exceed 0.5 m².

The capacity of the suction wells must not exceed 0.120 m³.

9.1.0.92 *Emergency exit*

Spaces the entrances or exits of which are partly or fully immersed in damaged condition shall be provided with an emergency exit not less than 0.10 m above the waterline. This does not apply to forepeak and afterpeak.

9.1.0.93 *Stability (general)*

9.1.0.93.1 Proof of sufficient stability shall be furnished including stability in the damaged condition.

9.1.0.93.2 The basic values for the stability calculation - the vessel's lightweight and the location of the centre of gravity - shall be determined either by means of an inclining experiment or by detailed mass and moment calculation. In the latter case the lightweight shall be checked by means of a lightweight test with a resulting difference of not more than $\pm 5\%$ between the mass determined by the calculation and the displacement determined by the draught readings.

9.1.0.93.3 Proof of sufficient intact stability shall be furnished for all stages of loading and unloading and for the final loading condition.

Floatability after damage shall be proved for the most unfavourable loading condition. For this purpose calculated proof of sufficient stability shall be established for critical intermediate stages of flooding and for the final stage of flooding. Negative values of stability in intermediate stages of flooding may be accepted only if the continued range of curve of righting lever in damaged condition indicates adequate positive values of stability.

9.1.0.94 *Stability (intact)*

9.1.0.94.1 The requirements for intact stability resulting from the damaged stability calculation shall be fully complied with.

9.1.0.94.2 For the carriage of containers, proof of sufficient stability shall also be furnished in accordance with the provisions of the Regulations referred to in 1.1.4.6.

9.1.0.94.3 The most stringent of the requirements of 9.1.0.94.1 and 9.1.0.94.2 above shall prevail for the vessel.

9.1.0.95 *Stability (damaged condition)*

9.1.0.95.1 The following assumptions shall be taken into consideration for the damaged condition:

(a) The extent of side damage is as follows:

longitudinal extent: at least 0.10 L, but not less than 5.00 m;
transverse extent: 0.59 m;
vertical extent: from the baseline upwards without limit;

(b) The extent of bottom damage is as follows:

longitudinal extent: at least 0.10 L, but not less than 5.00 m;
transverse extent: 3.00 m;
vertical extent: from the base 0.49 m upwards, the sump excepted;

(c) Any bulkheads within the damaged area shall be assumed damaged, which means that the location of bulkheads shall be chosen so as to ensure that the vessel remains afloat after the flooding of two or more adjacent compartments in the longitudinal direction.

The following provisions are applicable:

- For bottom damage also two adjacent athwartships compartments shall be assumed as flooded;
- The lower edge of any openings that cannot be closed watertight (e.g. doors, windows, access hatchways) shall, at the final stage of flooding, be not less than 0.10 m above the damage waterline;
- In general, permeability shall be assumed to be 95%. Where an average permeability of less than 95% is calculated for any compartment, this calculated value may be used.

However, the following minimum values shall be used:

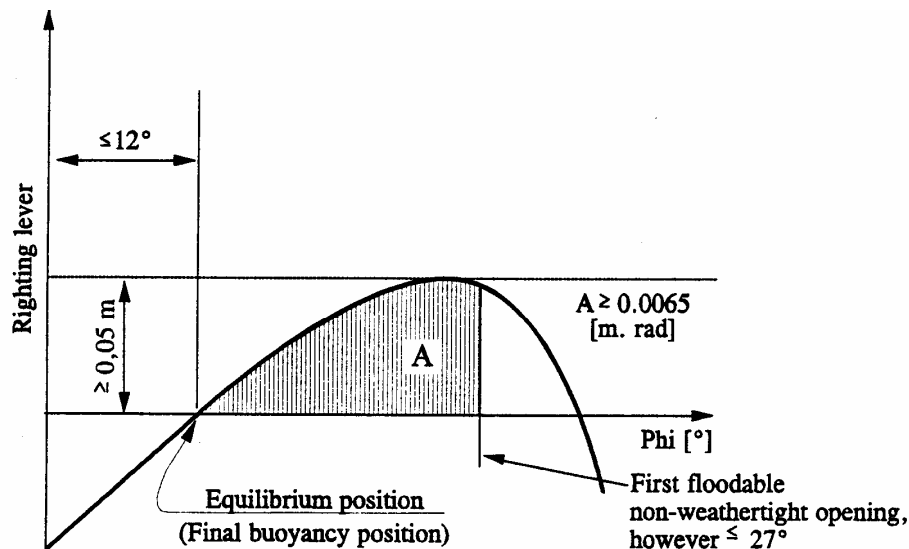
- engine rooms: 85%
- accommodation: 95%

- double bottoms, oil fuel tanks, ballast tanks, etc., depending on whether, according to their function, they have to be assumed as full or empty for the vessel floating at the maximum permissible draught: 0% or 95%

For the main engine room only the one-compartment standard needs to be taken into account, i.e. the end bulkheads of the engine room shall be assumed as not damaged.

- 9.1.0.95.2 At the stage of equilibrium (final stage of flooding) the angle of heel shall not exceed 12° . Non-watertight openings shall not be immersed before reaching the stage of equilibrium. If such openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purpose of stability calculation.

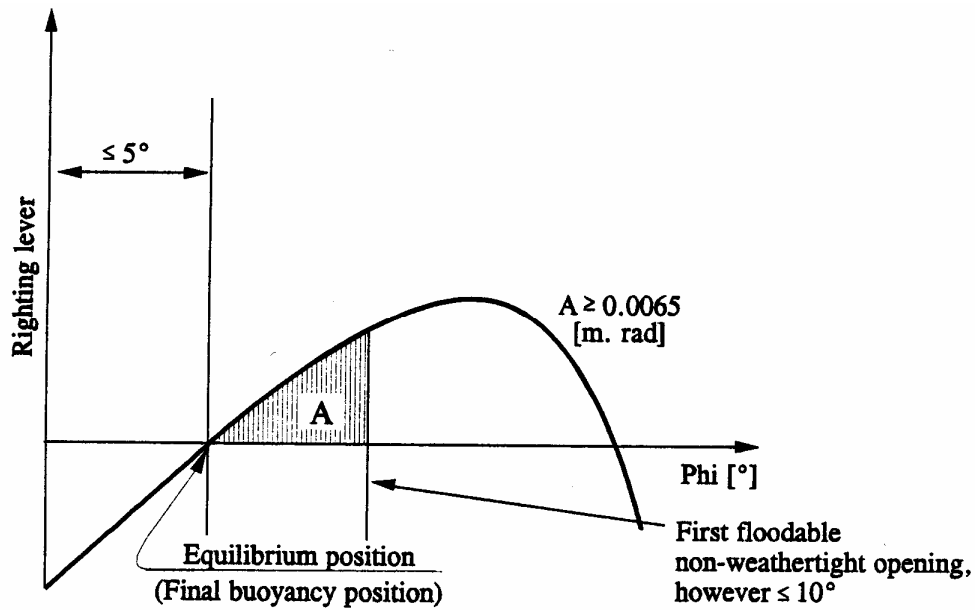
The positive range of the righting lever curve beyond the position of equilibrium shall have a righting lever of ≥ 0.05 m in association with an area under the curve of ≥ 0.0065 m.rad. The minimum values of stability shall be satisfied up to immersion of the first non-weathertight opening and in any event up to an angle of heel $\leq 27^\circ$. If non-weathertight openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purposes of stability calculation.



- 9.1.0.95.3 Inland navigation vessels carrying containers which have not been secured shall satisfy the following damage stability criteria:

At the stage of equilibrium (final stage of flooding) the angle of heel shall not exceed 5° . Non-watertight openings shall not be immersed before reaching the stage of equilibrium. If such openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purpose of stability calculation;

The positive range of the righting lever curve beyond the position of equilibrium shall have an area under the curve of ≥ 0.0065 m.rad. The minimum values of stability shall be satisfied up to immersion of the first non-weathertight opening and in any event up to an angle of heel $\leq 10^\circ$. If non-weathertight openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purposes of stability calculation.



- 9.1.0.95.4 If openings through which undamaged compartments may become additionally flooded are capable of being closed watertight, the closing devices shall be appropriately marked.
- 9.1.0.95.5 Where cross- or down-flooding openings are provided for reduction of unsymmetrical flooding, the time for equalisation shall not exceed 15 minutes if during the intermediate stages of flooding sufficient stability has been proved.
- 9.1.0.96-
9.1.0.99 (*Reserved*)

CHAPTER 9.2**RULES FOR CONSTRUCTION APPLICABLE TO SEAGOING
VESSELS WHICH COMPLY WITH THE REQUIREMENTS OF THE SOLAS 74 CONVENTION,
CHAPTER II-2, REGULATION 19 OR SOLAS 74, CHAPTER II-2, REGULATION 54**

9.2.0 The requirements of 9.2.0.0 to 9.2.0.79 are applicable to seagoing vessels which comply with the following requirements:

- SOLAS 74, Chapter II-2, Regulation 19 in its amended version; or
- SOLAS 74, Chapter II-2, Regulation 54 in its amended version in accordance with the resolutions mentioned in Chapter II-2, Regulation 1, paragraph 2.1, provided that the vessel was constructed before 1 July 2002.

Seagoing vessels which do not comply with the above-mentioned requirements of the SOLAS 74 Convention shall meet the requirements of 9.1.0.0 to 9.1.0.79.

9.2.0.0 *Materials of construction*

The vessels hull shall be constructed of shipbuilding steel or other metal, provided that this metal has at least equivalent mechanical properties and resistance to the effects of temperature and fire.

9.2.0.1-
9.2.0.19 (*Reserved*)

9.2.0.20 *Water ballast*

The double-hull spaces and double bottoms may be arranged for being filled with water ballast.

9.2.0.21-
9.2.0.30 (*Reserved*)

9.2.0.31 *Engines*

9.2.0.31.1 Only internal combustion engines running on a fuel having a flashpoint above 60 °C, are allowed.

9.2.0.31.2 Ventilation inlets of the engine rooms and the air intakes of the engines which do not take air in directly from the engine room shall be located not less than 2 m from the protected area.

9.2.0.31.3 Sparking shall not be possible in the protected area.

9.2.0.32-
9.2.0.33 (*Reserved*)

9.2.0.34 *Exhaust pipes*

9.2.0.34.1 Exhausts shall be evacuated from the vessel into the open-air either upwards through an exhaust pipe or through the shell plating. The exhaust outlet shall be located not less than 2.00 m from the hatchway openings. The exhaust pipes of engines shall be arranged so that the exhausts are led away from the vessel. The exhaust pipes shall not be located within the protected area.

9.2.0.34.2 Exhaust pipes shall be provided with a device preventing the escape of sparks, e.g. spark arresters.

9.2.0.35-
9.2.0.40 (*Reserved*)

9.2.0.41 *Fire and naked light*

9.2.0.41.1 The outlets of funnels shall be located not less than 2.00 m from the hatchway openings. Arrangements shall be provided to prevent the escape of sparks and the entry of water.

9.2.0.41.2 Heating, cooking and refrigerating appliances shall not be fuelled with liquid fuels, liquid gas or solid fuels. The installation in the engine room or other separate space of heating appliances fuelled with liquid fuel having a flashpoint above 55 °C shall, however, be permitted.

Cooking and refrigerating appliances are permitted only in wheelhouses with metal floor and in the accommodation.

9.2.0.41.3 Electric lighting appliances only are permitted outside the accommodation and the wheelhouse.

9.2.0.42-
9.2.0.70 (*Reserved*)

9.2.0.71 *Admittance on board*

The notice boards displaying the prohibition of admittance in accordance with 8.3.3 shall be clearly legible from either side of the vessel.

9.2.0.72-
9.2.0.73 (*Reserved*)

9.2.0.74 *Prohibition of smoking, fire and naked light*

9.2.0.74.1 The notice boards displaying the prohibition of smoking in accordance with 8.3.4 shall be clearly legible from either side of the vessel.

9.2.0.74.2 Notice boards indicating the circumstances under which the prohibition applies shall be fitted near the entrances to the spaces where smoking or the use of fire or naked light is not always prohibited.

9.2.0.74.3 Ashtrays shall be provided close to each exit of the wheelhouse.

9.2.0.75-
9.2.0.79 (*Reserved*)

9.2.0.80 *Additional rules applicable to double-hull vessels*

The rules of 9.2.0.88 to 9.2.0.99 are applicable to double-hull vessels intended to carry dangerous goods of Classes 2, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 7, 8 or 9, except those for which label No. 1 is prescribed in column (5) of Table A of Chapter 3.2, in quantities exceeding those of 7.1.4.1.1.

9.2.0.81- (*Reserved*)

9.2.0.87

9.2.0.88 ***Classification***

9.2.0.88.1 Double-hull vessels intended to carry dangerous goods of Classes 2, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 7, 8 or 9 except those for which label No. 1 is prescribed in column (5) of Table A of Chapter 3.2, in quantities exceeding those referred to in 7.1.4.1, shall be built under survey of a recognised classification society in accordance with the rules established by that classification society to its highest class. This shall be confirmed by the classification society by the issue of an appropriate certificate.

9.2.0.88.2 The vessel's highest class shall be continued.

9.2.0.89-
9.2.0.90 (*Reserved*)

9.2.0.91 ***Holds***

9.2.0.91.1 The vessel shall be built as a double-hull vessel with double-wall spaces and double bottom within the protected area.

9.2.0.91.2 The distance between the sides of the vessel and the longitudinal bulkheads of the hold shall be not less than 0.80 m. A locally reduced distance at the vessel's ends shall be permitted, provided the smallest distance between vessel's side and the longitudinal bulkhead (measured perpendicular to the side) is not less than 0.60 m. The sufficient structural strength of the vessel (longitudinal, transverse and local strength) shall be confirmed by the class certificate.

9.2.0.91.3 The depth of the double bottom shall be not less than 0.50 m.

The depth below the suction wells may however be locally reduced to 0.40 m, provided the suction well has a capacity of not more than 0.03 m³.

9.2.0.92 (*Reserved*)

9.2.0.93 ***Stability (general)***

9.2.0.93.1 Proof of sufficient stability shall be furnished including stability in the damaged condition.

9.2.0.93.2 The basic values for the stability calculation - the vessel's lightweight and the location of the centre of gravity - shall be determined either by means of an inclining experiment or by detailed mass and moment calculation. In the latter case the lightweight shall be checked by means of a lightweight test with a resulting difference of not more than $\pm 5\%$ between the mass determined by the calculation and the displacement determined by the draught readings.

9.2.0.93.3 Proof of sufficient intact stability shall be furnished for all stages of loading and unloading and for the final loading condition.

Floatability after damage shall be proved for the most unfavourable loading condition. For this purpose calculated proof of sufficient stability shall be established for critical intermediate stages of flooding and for the final stage of flooding. Negative values of stability in intermediate stages of flooding may be accepted only if the continued range of curve of righting lever in damaged condition indicates adequate positive values of stability.

9.2.0.94 ***Stability (intact)***

- 9.2.0.94.1 The requirements for intact stability resulting from the damaged stability calculation shall be fully complied with.
- 9.2.0.94.2 For the carriage of containers, additional proof of sufficient stability shall be furnished in accordance with the requirements of the Regulations referred to in 1.1.4.6.
- 9.2.0.94.3 The most stringent of the requirements of 9.2.0.94.1 and 9.2.0.94.2 shall prevail for the vessel.
- 9.2.0.94.4 For seagoing vessels the provisions of 9.2.0.94.2 above may be regarded as having been complied with if the stability conforms to Resolution A.749 (18) from the International Maritime Organization and the stability documents have been checked by the competent authority. This applies only when all containers are secured as usual on seagoing vessels and a relevant stability document has been approved by the competent authority.

9.2.0.95 ***Stability (damaged condition)***

- 9.2.0.95.1 The following assumptions shall be taken into consideration for the damaged condition:
- (a) The extent of side damage is as follows:
- longitudinal extent: at least 0.10 L, but not less than 5.00 m;
 transverse extent: 0.59 m;
 vertical extent: from the baseline upwards without limit;
- (b) The extent of bottom damage is as follows:
- longitudinal extent: at least 0.10 L, but not less than 5.00 m;
 transverse extent: 3.00 m;
 vertical extent: from the base 0.49 m upwards, the sump excepted;
- (c) Any bulkheads within the damaged area shall be assumed damaged, which means that the location of bulkheads shall be chosen so that the vessel will remain afloat after flooding of two or more adjacent compartments in the longitudinal direction.

The following provisions are applicable:

- For bottom damage, adjacent athwartship compartments shall also be assumed as flooded;
- The lower edge of any openings that cannot be closed watertight (e.g. doors, windows, access hatchways) shall, at the final stage of flooding, be not less than 0.10 m above the damage waterline;
- In general, permeability shall be assumed to be 95%. Where an average permeability of less than 95% is calculated for any compartment, this calculated value may be used.

However, the following minimum values shall be used:

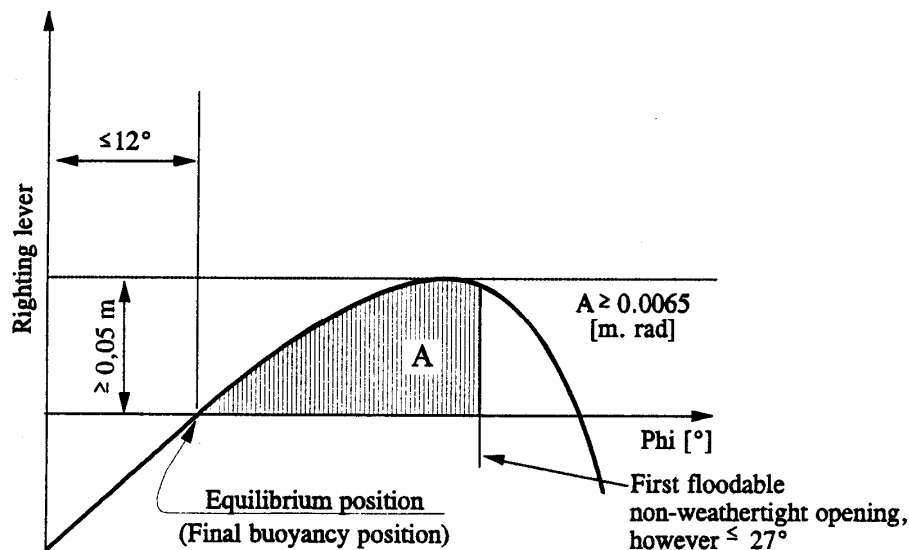
- | | |
|----------------------|-----|
| – engine rooms | 85% |
| – accommodation | 95% |

- double bottoms, oil fuel tanks, ballast tanks, etc., depending on whether according to their function, they have to be assumed as full or empty for the vessel floating at the maximum permissible draught 0% or 95%

For the main engine room only the one-compartment standard needs to be taken into account. (Consequently, the end bulkheads of the engine room shall be assumed as not damaged.)

- 9.2.0.95.2 At the stage of equilibrium (final stage of flooding) the angle of heel shall not exceed 12° . Non-watertight openings shall not be immersed before reaching the stage of equilibrium. If such openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purpose of stability calculation.

The positive range of the righting lever curve beyond the position of equilibrium shall have a righting lever of ≥ 0.05 m in association with an area under the curve of ≥ 0.0065 m.rad. The minimum values of stability shall be satisfied up to immersion of the first non-weathertight opening and in any event up to an angle of heel $\leq 27^\circ$. If non-weathertight openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purposes of stability calculation.



- 9.2.0.95.3 If openings through which undamaged compartments may become additionally flooded are capable of being closed watertight, the closing devices shall be appropriately marked.
- 9.2.0.95.4 Where cross- or down-flooding openings are provided for reduction of unsymmetrical flooding, the time for equalisation shall not exceed 15 minutes if during the intermediate stages of flooding sufficient stability has been proved.
- 9.2.0.96-9.2.0.99 (Reserved)

CHAPTER 9.3

RULES FOR CONSTRUCTION OF TANK VESSELS

9.3.1 Rules for construction of type G tank vessels

The rules for construction of 9.3.1.0 to 9.3.1.99 apply to type G tank vessels.

9.3.1.0 *Materials of construction*

- 9.3.1.0.1 (a) The vessel's hull and the cargo tanks shall be constructed of shipbuilding steel or other at least equivalent metal.

The independent cargo tanks may also be constructed of other materials, provided these have at least equivalent mechanical properties and resistance against the effects of temperature and fire.

- (b) Every part of the vessel including any installation and equipment which may come into contact with the cargo shall consist of materials which can neither be dangerously affected by the cargo nor cause decomposition of the cargo or react with it so as to form harmful or hazardous products.

- 9.3.1.0.2 Except where explicitly permitted in 9.3.1.0.3 below or in the certificate of approval, the use of wood, aluminium alloys or plastic materials within the cargo area is prohibited.

- 9.3.1.0.3 (a) The use of wood, aluminium alloys or plastic materials within the cargo area is only permitted for:

- gangways and external ladders;
- movable items of equipment;
- chocking of cargo tanks which are independent of the vessel's hull and chocking of installations and equipment;
- masts and similar round timber;
- engine parts;
- parts of the electrical installation;
- lids of boxes which are placed on the deck.

- (b) The use of wood or plastic materials within the cargo area is only permitted for:

- supports and stops of any kind.

- (c) The use of plastic materials or rubber within the cargo area is only permitted for:

- all kinds of gaskets (e.g. for dome or hatch covers);
- electric cables;
- hoses for loading and unloading;
- insulation of cargo tanks and of hoses for loading and unloading.

- (d) All permanently fitted materials in the accommodation or wheelhouse, with the exception of furniture, shall not readily ignite. They shall not evolve fumes or toxic gases in dangerous quantities, if involved in a fire.

9.3.1.0.4 The paint used in the cargo area shall not be liable to produce sparks in case of impact.

9.3.1.0.5 The use of plastic material for vessel's boats is permitted only if the material does not readily ignite.

9.3.1.1-
9.3.1.7 (*Reserved*)

9.3.1.8 *Classification*

9.3.1.8.1 The tank vessel shall be built under survey of a recognised classification society in accordance with the rules established by that classification society for its highest class, and the tank vessel shall be classed accordingly.

The vessel's highest class shall be continued.

The classification society shall issue a certificate certifying that the vessel is in conformity with the rules of this section.

The design pressure and the test pressure of cargo tanks shall be entered in the certificate.

If a vessel has cargo tanks with different valve opening pressures, the design and test pressures of each tank shall be entered in the certificate.

The classification society shall draw up a certificate mentioning all the dangerous goods accepted for carriage by the vessel (see also 1.16.1.2.5).

9.3.1.8.2 The cargo pump-rooms shall be inspected by a recognised classification society whenever the certificate of approval has to be renewed as well as during the third year of validity of the certificate of approval. The inspection shall comprise at least:

- an inspection of the whole system for its condition, for corrosion, leakage or conversion works which have not been approved;
- a checking of the condition of the gas detection system in the cargo pump-rooms.

Inspection certificates signed by the recognised classification society with respect to the inspection of the cargo pump-rooms shall be kept on board. The inspection certificates shall at least include particulars of the above inspection and the results obtained as well as the date of the inspection.

9.3.1.8.3 The condition of the gas detection system referred to in 9.3.1.52.3 shall be checked by a recognised classification society whenever the certificate of approval has to be renewed and during the third year of validity of the certificate of approval. A certificate signed by the recognised classification society shall be kept on board.

9.3.1.9 (*Reserved*)

9.3.1.10 *Protection against the penetration of gases*

9.3.1.10.1 The vessel shall be designed so as to prevent gases from penetrating into the accommodation and the service spaces.

9.3.1.10.2 Outside the cargo area, the lower edges of door-openings in the sidewalls of superstructures and the coamings of access hatches to under-deck spaces shall have a height of not less than 0.50 m above the deck

This requirement need not be complied with if the wall of the superstructures facing the cargo area extends from one side of the ship to the other and has doors the sills of which have a height of not less than 0.50 m. The height of this wall shall not be less than 2.00 m. In this case, the lower edges of door-openings in the sidewalls of superstructures and the coamings of access hatches behind this wall shall have a height of not less than 0.10 m. The sills of engine room doors and the coamings of its access hatches shall, however, always have a height of not less than 0.50 m.

9.3.1.10.3 In the cargo area, the lower edges of door-openings in the sidewalls of superstructures shall have a height of not less than 0.50 m above the deck and the sills of hatches and ventilation openings of premises located under the deck shall have a height of not less than 0.50 m above the deck. This requirement does not apply to access openings to double-hull and double bottom spaces.

9.3.1.10.4 The bulwarks, foot-rails, etc shall be provided with sufficiently large openings which are located directly above the deck.

9.3.1.11 *Hold spaces and cargo tanks*

9.3.1.11.1 (a) The maximum permissible capacity of a cargo tank shall be determined in accordance with the following table:

$L \times B \times H$ (m ³)	Maximum permissible capacity of a cargo tank (m ³)
up to 600	$L \times B \times H \times 0.3$
600 to 3 750	$180 + (L \times B \times H - 600) \times 0.0635$
> 3 750	380

Alternative constructions in accordance with 9.3.4 are permitted.

In the table above $L \times B \times H$ is the product of the main dimensions of the tank vessel in metres (according to the measurement certificate), where:

L = overall length of the hull in m;

B = extreme breadth of the hull in m;

H = shortest vertical distance between the top of the keel and the lowest point of the deck at the side of the vessel (moulded depth) within the cargo area in m;

where:

For trunk vessels, H shall be replaced by H', where H' shall be obtained from the following formula:

$$H' = H + \left(ht \times \frac{bt}{B} \times \frac{lt}{L} \right)$$

where:

ht = trunk height (distance between trunk deck and main deck measured on trunk side at L/2) in m;

bt = trunk breadth in m;

lt = trunk length in m;

- (b) Pressure tanks whose ratio of length to diameter exceeds 7 are prohibited.
- (c) The pressure tanks shall be designed for a cargo temperature of + 40 °C.

9.3.1.11.2 (a) In the cargo area, the hull shall be designed as follows:¹

- as a double-hull and double bottom vessel. The internal distance between the sideplatings of the vessel and the longitudinal bulkheads shall not be less than 0.80 m, the height of the double bottom shall be not less than 0.60 m, the cargo tanks shall be supported by saddles extending between the tanks to not less than 20° below the horizontal centreline of the cargo tanks.

Refrigerated cargo tanks shall be installed only in hold spaces bounded by double-hull spaces and double-bottom. Cargo tank fastenings shall meet the requirements of a recognised classification society; or

- as a single-hull vessel with the sideplatings of the vessel between gangboard and top of floor plates provided with side stringers at regular intervals of not more than 0.60 m which are supported by web frames spaced at intervals of not more than 2.00 m. The side stringers and the web frames shall have a height of not less than 10% of the depth, however, not less than 0.30 m. The side stringers and web frames shall be fitted with a face plate made of flat steel and having a cross-section of not less than 7.5 cm² and 15 cm², respectively.

The distance between the sideplating of the vessel and the cargo tanks shall be not less than 0.80 m and between the bottom and the cargo tanks not less than 0.60 m. The depth below the suction wells may be reduced to 0.50 m.

The lateral distance between the suction well of the cargo tanks and the bottom structure shall be not less than 0.10 m.

The cargo tank supports and fastenings should extend to not less than 10° below the horizontal centreline of the cargo tanks.

- (b) The cargo tanks shall be fixed so that they cannot float.
- (c) The capacity of a suction well shall be limited to not more than 0.10 m³. For pressure cargo tanks, however, the capacity of a suction well may be of 0.20 m³.
- (d) Side-struts linking or supporting the load-bearing components of the sides of the vessel with the load-bearing components of the longitudinal walls of cargo tanks and side-struts linking the load-bearing components of the vessel's bottom with the tank-bottom are prohibited.

¹ For a different design of the hull in the cargo area, proof shall be furnished by way of calculation that in the event of a lateral collision with another vessel having a straight bow, an energy of 22 MJ can be absorbed without any rupture of the cargo tanks and the piping leading to the cargo tanks. Alternative constructions in accordance with 9.3.4 are permitted.

- 9.3.1.11.3 (a) The hold spaces shall be separated from the accommodation and service spaces outside the cargo area below deck by bulkheads provided with a Class A-60 fire protection insulation according to SOLAS 74, Chapter II-2, Regulation 3. A space of not less than 0.20 m shall be provided between the cargo tanks and the end bulkheads of the hold spaces. Where the cargo tanks have plane end bulkheads this space shall be not less than 0.50 m.
- (b) The hold spaces and cargo tanks shall be capable of being inspected.
- (c) All spaces in the cargo area shall be capable of being ventilated. Means for checking their gas-free condition shall be provided.
- 9.3.1.11.4 The bulkheads bounding the hold spaces shall be watertight. The cargo tanks and the bulkheads bounding the cargo area shall have no openings or penetrations below deck. The bulkhead between the engine room and the service spaces within the cargo area or between the engine room and a hold space may be fitted with penetrations provided that they conform to the requirements of 9.3.1.17.5.
- 9.3.1.11.5 Double-hull spaces and double bottoms in the cargo area shall be arranged for being filled with ballast water only. Double bottoms may, however, be used as oil fuel tanks, provided they comply with the requirements of 9.3.1.32.
- 9.3.1.11.6 (a) A space in the cargo area below deck may be arranged as a service space, provided that the bulkhead bounding the service space extends vertically to the bottom and the bulkhead not facing the cargo area extends from one side of the vessel to the other in one frame plane. This service space shall only be accessible from the deck.
- (b) The service space shall be watertight with the exception of its access hatches and ventilation inlets.
- (c) No pipes for loading or unloading shall be fitted within the service space referred to under (a) above.
- Pipes for loading and unloading may be fitted in the cargo pump-rooms below deck only when they conform to the provisions of 9.3.1.17.6.
- 9.3.1.11.7 Where service spaces are located in the cargo area under deck, they shall be arranged so as to be easily accessible and to permit persons wearing protective clothing and breathing apparatus to safely operate the service equipment contained therein. They shall be designed so as to allow injured or unconscious personnel to be removed from such spaces without difficulty, if necessary by means of fixed equipment.
- 9.3.1.11.8 Hold spaces and other accessible spaces within the cargo area shall be arranged so as to ensure that they may be completely inspected and cleaned in an appropriate manner. The dimensions of openings, except for those of double-hull spaces and double bottoms which do not have a wall adjoining the cargo tanks, shall be sufficient to allow a person wearing breathing apparatus to enter or leave the space without difficulty. These openings shall have a minimum cross-sectional area of 0.36 m² and a minimum side length of 0.50 m. They shall be designed so as to allow injured or unconscious persons to be removed from the bottom of such spaces without difficulties, if necessary by means of fixed equipment. In these spaces the distance between the reinforcements shall not be less than 0.50 m. In double bottoms this distance may be reduced to 0.45 m.

Cargo tanks may have circular openings with a diameter of not less than 0.68 m.

9.3.1.12 ***Ventilation***

9.3.1.12.1 Each hold space shall have two openings the dimensions and location of which shall be such as to permit effective ventilation of any part of the hold space. If there are no such openings, it shall be possible to fill the hold spaces with inert gas or dry air.

9.3.1.12.2 Double-hull spaces and double bottoms within the cargo area which are not arranged for being filled with ballast water and cofferdams between engine rooms and pump-rooms, if they exist, shall be provided with ventilation systems.

9.3.1.12.3 Any service spaces located in the cargo area below deck shall be provided with a system of forced ventilation with sufficient power for ensuring at least 20 changes of air per hour based on the volume of the space.

The ventilation exhaust ducts shall extend down to 50 mm above the bottom of the service space. The air shall be supplied through a duct at the top of the service space. The air inlets shall be located not less than 2.00 m above the deck, at a distance of not less than 2.00 m from tank openings and 6.00 m from the outlets of safety valves.

The extension pipes, which may be necessary, may be of the hinged type.

9.3.1.12.4 Ventilation of accommodation and service spaces shall be possible.

9.3.1.12.5 Ventilators used in the cargo area shall be designed so that no sparks may be emitted on contact of the impeller blades with the housing and no static electricity may be generated.

9.3.1.12.6 Notice boards shall be fitted at the ventilation inlets indicating the conditions when they shall be closed. All ventilation inlets of accommodation and service spaces leading outside shall be fitted with fire flaps. Such ventilation inlets shall be located not less than 2.00 m from the cargo area.

Ventilation inlets of service spaces in the cargo area may be located within such area.

9.3.1.13 ***Stability (general)***

9.3.1.13.1 Proof of sufficient stability shall be furnished including for stability in damaged condition.

9.3.1.13.2 The basic values for the stability calculation - the vessel's lightweight and location of the centre of gravity - shall be determined either by means of an inclining experiment or by detailed mass and moment calculation. In the latter case the lightweight of the vessel shall be checked by means of a lightweight test with a tolerance limit of $\pm 5\%$ between the mass determined by calculation and the displacement determined by the draught readings.

9.3.1.13.3 Proof of sufficient intact stability shall be furnished for all stages of loading and unloading and for the final loading condition.

Floatability after damage shall be proved for the most unfavourable loading condition. For this purpose, calculated proof of sufficient stability shall be established for critical intermediate stages of flooding and for the final stage of flooding. Negative values of stability in intermediate stages of flooding may be accepted only if the continued range of curve of righting lever in damaged condition indicates adequate positive values of stability.

9.3.1.14 ***Stability (intact)***

The requirements for intact stability resulting from the damaged stability calculation shall be fully complied with.

9.3.1.15 *Stability (damaged condition)*

9.3.1.15.1 The following assumptions shall be taken into consideration for the damaged condition:

(a) The extent of side damage is as follows:

longitudinal extent: at least 0.10 L, but not less than 5.00 m;
 transverse extent: 0.79 m;
 vertical extent: from the base line upwards without limit;

(b) The extent of bottom damage is as follows:

longitudinal extent: at least 0.10 L, but not less than 5.00 m;
 transverse extent: 3.00 m;
 vertical extent: from the base 0.59 m upwards, the well excepted;

(c) Any bulkheads within the damaged area shall be assumed damaged, which means that the location of bulkheads shall be chosen so as to ensure that the vessel remains afloat after the flooding of two or more adjacent compartments in the longitudinal direction.

The following provisions are applicable:

- For bottom damage, adjacent athwartship compartments shall also be assumed as flooded;
- The lower edge of any non-watertight openings (e.g. doors, windows, access hatchways) shall, at the final stage of flooding, be not less than 0.10 m above the damage waterline;
- In general, permeability shall be assumed to be 95%. Where an average permeability of less than 95% is calculated for any compartment, this calculated value obtained may be used.

However, the following minimum values shall be used:

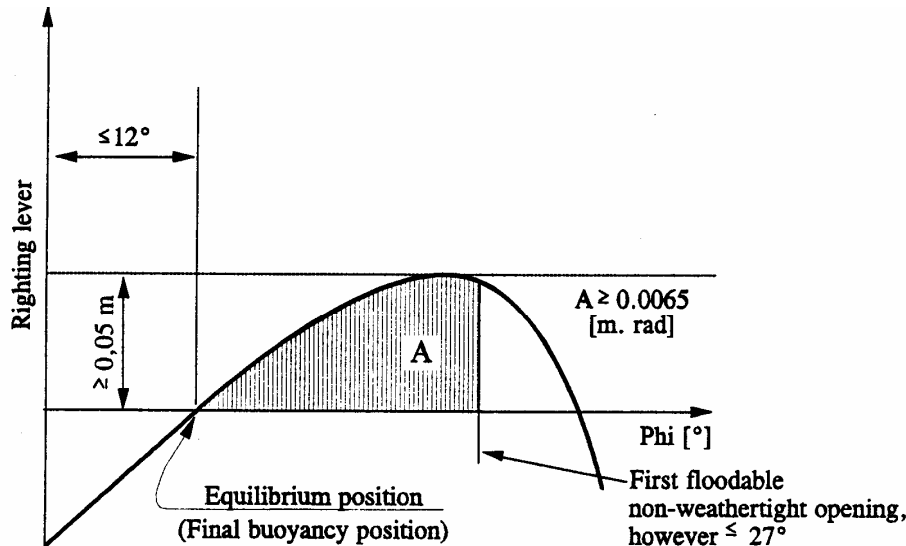
- engine rooms: 85%;
- accommodation: 95%;
- double bottoms, oil fuel tanks, ballast tanks, etc., depending on whether, according to their function, they have to be assumed as full or empty for the vessel floating at the maximum permissible draught: 0% or 95%.

For the main engine room only the one-compartment standard need be taken into account, i.e. the end bulkheads of the engine room shall be assumed as not damaged.

9.3.1.15.2 At the stage of equilibrium (final stage of flooding), the angle of heel shall not exceed 12°. Non-watertight openings shall not be flooded before reaching the stage of equilibrium. If such openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purpose of stability calculation.

The positive range of the righting lever curve beyond the stage of equilibrium shall have a righting level of ≥ 0.05 m in association with an area under the curve of ≥ 0.0065 m.rad. The

minimum values of stability shall be satisfied up to immersion of the first non-weathertight opening and in any event up to an angle of heel $\leq 27^\circ$. If non-weathertight openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purpose of stability calculation.



9.3.1.15.3 If openings through which undamaged compartments may additionally become flooded are capable of being closed watertight, the closing appliances shall be marked accordingly.

9.3.1.15.4 When cross- or down-flooding openings are provided for reduction of unsymmetrical flooding, the time for equalisation shall not exceed 15 minutes, if during the intermediate stages of flooding sufficient stability has been proved.

9.3.1.16 *Engine rooms*

9.3.1.16.1 Internal combustion engines for the vessel's propulsion as well as internal combustion engines for auxiliary machinery shall be located outside the cargo area. Entrances and other openings of engine rooms shall be at a distance of not less than 2.00 m from the cargo area.

9.3.1.16.2 The engine room shall be accessible from the deck; the entrances shall not face the cargo area. When the doors are not located in a recess whose depth is at least equal to the door width, the hinges shall face the cargo area.

9.3.1.17 *Accommodation and service spaces*

9.3.1.17.1 Accommodation spaces and the wheelhouse shall be located outside the cargo area forward of the fore vertical plane or abaft the aft vertical plane bounding the part of cargo area below deck. Windows of the wheelhouse which are located not less than 1.00 m above the bottom of the wheelhouse may tilt forward.

9.3.1.17.2 Entrances to spaces and openings of superstructures shall not face the cargo area. Doors opening outward and not located in a recess the depth of which is at least equal to the width of the doors shall have their hinges facing the cargo area.

9.3.1.17.3 Entrances from the deck and openings of spaces facing the weather shall be capable of being closed. The following instruction shall be displayed at the entrance of such spaces:

**Do not open during loading and unloading without
the permission of the master.
Close immediately.**

- 9.3.1.17.4 Entrances and windows of superstructures and accommodation spaces which can be opened as well as other openings of these spaces shall be located not less than 2.00 m from the cargo area. No wheelhouse doors and windows shall be located within 2.00 m from the cargo area, except where there is no direct connection between the wheelhouse and the accommodation.
- 9.3.1.17.5
- (a) Driving shafts of the bilge or ballast pumps may penetrate through the bulkhead between the service space and the engine room, provided the arrangement of the service space is in compliance with 9.3.1.11.6.
 - (b) The penetration of the shaft through the bulkhead shall be gastight and shall have been approved by a recognised classification society.
 - (c) The necessary operating instructions shall be displayed.
 - (d) Penetrations through the bulkhead between the engine room and the service space in the cargo area, and the bulkhead between the engine room and the hold spaces may be provided for electrical cables, hydraulic lines and piping for measuring, control and alarm systems, provided that the penetrations have been approved by a recognised classification society. The penetrations shall be gastight. Penetrations through a bulkhead with an "A-60" fire protection insulation according to SOLAS 74, Chapter II-2, Regulation 3, shall have an equivalent fire protection.
 - (e) Pipes may pass through the bulkhead between the engine room and the service space in the cargo area provided that these are pipes between the mechanical equipment in the engine room and the service space which do not have any openings within the service space and which are provided with shut-off devices at the bulkhead in the engine room.
 - (f) Notwithstanding 9.3.1.11.4, pipes from the engine room may pass through the service space in the cargo area or a cofferdam or a hold space or a double-hull space to the outside provided that within the service space or cofferdam or hold space or double-hull space they are of the thick-walled type and have no flanges or openings.
 - (g) Where a driving shaft of auxiliary machinery penetrates through a wall located above the deck the penetration shall be gastight.
- 9.3.1.17.6 A service space located within the cargo area below deck shall not be used as a cargo pump-room for the vessel's own gas discharging system, e.g. compressors or the compressor/heat exchanger/pump combination, except where:
- the pump-room is separated from the engine room or from service spaces outside the cargo area by a cofferdam or a bulkhead with an "A-60" fire protection insulation according to SOLAS 74, Chapter II-2, Regulation 3, or by a service space or a hold space;
 - the "A-60" bulkhead required above does not include penetrations referred to in 9.3.1.17.5 (a);
 - ventilation exhaust outlets are located not less than 6.00 m from entrances and openings of the accommodation and service spaces;
 - the access hatches and ventilation inlets can be closed from the outside;

- all pipes for loading and unloading (at the suction side and delivery side) are led through the deck above the pump-room. The necessary operation of the control devices in the pump-room, starting of pumps or compressors and necessary control of the liquid flow rate shall be effected from the deck;
- the system is fully integrated in the gas and liquid piping system;
- the cargo pump-room is provided with a permanent gas detection system which automatically indicates the presence of explosive gases or lack of oxygen by means of direct-measuring sensors and which actuates a visual and audible alarm when the gas concentration has reached 20% of the lower explosive limit. The sensors of this system shall be placed at suitable positions at the bottom and directly below the deck.

Measurement shall be continuous.

The audible and visual alarms are installed in the wheelhouse and in the cargo pump-room and, when the alarm is actuated, the loading and unloading system is shut down. Failure of the gas detection system shall be immediately signalled in the wheelhouse and on deck by means of audible and visual alarms;

- the ventilation system prescribed in 9.3.1.12.3 has a capacity of not less than 30 changes of air per hour based on the total volume of the service space.

9.3.1.17.7 The following instruction shall be displayed at the entrance of the cargo pump-room:

**Before entering the cargo pump-room check whether
it is free from gases and contains sufficient oxygen.
Do not open doors and entrance openings without
the permission of the master.
Leave immediately in the event of alarm.**

9.3.1.18 *Inerting facility*

In cases in which inerting or blanketing of the cargo is prescribed, the vessel shall be equipped with an inerting system.

This system shall be capable of maintaining a permanent minimum pressure of 7 kPa (0.07 bar) in the spaces to be inerted. In addition, the inerting system shall not increase the pressure in the cargo tank to a pressure greater than that at which the pressure valve is regulated. The set pressure of the vacuum-relief valve shall be 3.5 kPa (0.035 bar).

A sufficient quantity of inert gas for loading or unloading shall be carried or produced on board if it is not possible to obtain it on shore. In addition, a sufficient quantity of inert gas to offset normal losses occurring during carriage shall be on board.

The premises to be inerted shall be equipped with connections for introducing the inert gas and monitoring systems so as to ensure the correct atmosphere on a permanent basis.

When the pressure or the concentration of inert gas in the gaseous phase falls below a given value, this monitoring system shall activate an audible and visible alarm in the wheelhouse. When the wheelhouse is unoccupied, the alarm shall also be perceptible in a location occupied by a crew member.

9.3.1.19- (*Reserved*)

9.3.1.20

9.3.1.21 *Safety and control installations*

9.3.1.21.1 Cargo tanks shall be provided with the following equipment:

- (a) *(Reserved)*;
- (b) a level gauge;
- (c) a level alarm device which is activated at the latest when a degree of filling of 86% is reached;
- (d) a high level sensor for actuating the facility against overflowing at the latest when a degree of filling of 97.5% is reached;
- (e) an instrument for measuring the pressure of the gas phase in the cargo tank;
- (f) an instrument for measuring the temperature of the cargo;
- (g) a connection for a closed sampling device.

9.3.1.21.2 When the degree of filling in per cent is determined, an error of not more than 0.5% is permitted. It shall be calculated on the basis of the total cargo tank capacity including the expansion trunk.

9.3.1.21.3 The level gauge shall allow readings from the control position of the shut-off devices of the particular cargo tank. The permissible maximum filling level of the cargo tank shall be marked on each level gauge.

Permanent reading of the overpressure and vacuum shall be possible from a location from which loading or unloading operations may be interrupted. The permissible maximum overpressure and vacuum shall be marked on each level gauge.

Readings shall be possible in all weather conditions.

9.3.1.21.4 The level alarm device shall give a visual and audible warning on board when actuated. The level alarm device shall be independent of the level gauge.

9.3.1.21.5 (a) The high level sensor referred to in 9.3.1.21.1 (d) shall give a visual and audible alarm on board and at the same time actuate an electrical contact which in the form of a binary signal interrupts the electric current loop provided and fed by the shore facility, thus initiating measures at the shore facility against overflowing during loading operations.

The signal shall be transmitted to the shore facility via a watertight two-pin plug of a connector device in accordance with standard EN 60309-2:1999 for direct current of 40 to 50 volts, identification colour white, position of the nose 10 h.

The plug shall be permanently fitted to the vessel close to the shore connections of the loading and unloading pipes.

The high level sensor shall also be capable of switching off the vessel's own discharging pump.

The high level sensor shall be independent of the level alarm device, but it may be connected to the level gauge.

- (b) During discharging by means of the on-board pump, it shall be possible for the shore facility to switch it off. For this purpose, an independent intrinsically safe power line, fed by the vessel, shall be switched off by the shore facility by means of an electrical contact.

It shall be possible for the binary signal of the shore facility to be transmitted via a watertight two-pole socket or a connector device in accordance with standard EN 60309-2:1999, for direct current of 40 to 50 volts, identification colour white, position of the nose 10 h.

This socket shall be permanently fitted to the vessel close to the shore connections of the unloading pipes.

- 9.3.1.21.6 The visual and audible signals given by the level alarm device shall be clearly distinguishable from those of the high level sensor.

The visual alarm shall be visible at each control position on deck of the cargo tank stop valves. It shall be possible to easily check the functioning of the sensors and electric circuits or these shall be of the “failsafe” design.

- 9.3.1.21.7 When the pressure or the temperature exceeds a set value, the instruments for measuring the pressure and the temperature of the cargo shall activate a visual and an audible alarm in the wheelhouse. When the wheelhouse is unoccupied the alarm shall also be perceptible in a location occupied by a crew member.

When the pressure exceeds a set value during loading or unloading, the instrument for measuring the pressure shall simultaneously initiate an electrical contact which, by means of the plug referred to in 9.3.1.21.5 above, enables measures to be taken to interrupt the loading and unloading operation. When the vessel’s own discharge pump is used, it shall be switched off automatically. The sensor for the alarms referred to above may be connected to the alarm installation.

- 9.3.1.21.8 Where the control elements of the shut-off devices of the cargo tanks are located in a control room, it shall be possible to stop the loading pumps and read the level gauges in the control room, and the visual and audible warning given by the level alarm device, the high level sensor referred to in 9.3.1.21.1 (d) and the instruments for measuring the pressure and temperature of the cargo shall be noticeable in the control room and on deck.

Satisfactory monitoring of the cargo area shall be ensured from the control room.

- 9.3.1.21.9 The vessel shall be so equipped that loading or unloading operations can be interrupted by means of switches, i.e. the quick-action stop valve located on the flexible vessel-to-shore connecting line must be capable of being closed. The switches shall be placed at two points on the vessel (fore and aft).

The interruption systems shall be designed according to the quiescent current principle.

- 9.3.1.21.10 When refrigerated substances are carried the opening pressure of the safety system shall be determined by the design of the cargo tanks. In the event of the transport of substances that must be carried in a refrigerated state the opening pressure of the safety system shall be not less than 25 kPa (0.25 bar) greater than the maximum pressure calculated according to 9.3.1.27.

9.3.1.22 *Cargo tank openings*

- 9.3.1.22.1 (a) Cargo tank openings shall be located on deck in the cargo area.
- (b) Cargo tank openings with a cross-section greater than 0.10 m² shall be located not less than 0.50 m above the deck.
- 9.3.1.22.2 Cargo tank openings shall be fitted with gastight closures which comply with the provisions of 9.3.1.23.1.
- 9.3.1.22.3 The exhaust outlets of the pressure relief valves shall be located not less than 2.00 m above the deck at a distance of not less than 6.00 m from the accommodation and from the service spaces located outside the cargo area. This height may be reduced when within a radius of 1.00 m round the pressure relief valve outlet there is no equipment, no work is being carried out and signs indicate the area.
- 9.3.1.22.4 The closing devices normally used in loading and unloading operations shall not be capable of producing sparks when operated.
- 9.3.1.22.5 Each tank in which refrigerated substances are carried shall be equipped with a safety system to prevent unauthorized vacuum or overpressure.

9.3.1.23 *Pressure test*

- 9.3.1.23.1 Cargo tanks and pipes for loading and unloading shall comply with the provisions concerning pressure vessels which have been established by the competent authority or a recognised classification society for the substances carried.
- 9.3.1.23.2 Any cofferdams shall be subjected to initial tests before being put into service and thereafter at the prescribed intervals.
- The test pressure shall be not less than 10 kPa (0.10 bar) gauge pressure.
- 9.3.1.23.3 The maximum intervals for the periodic tests referred to in 9.3.1.23.2 above shall be 11 years.

9.3.1.24 *Regulation of cargo pressure and temperature*

- 9.3.1.24.1 Unless the entire cargo system is designed to resist the full effective vapour pressure of the cargo at the upper limits of the ambient design temperatures, the pressure of the tanks shall be kept below the permissible maximum set pressure of the safety valves, by one or more of the following means:
- (a) a system for the regulation of cargo tank pressure using mechanical refrigeration;
- (b) a system ensuring safety in the event of the heating or increase in pressure of the cargo. The insulation or the design pressure of the cargo tank, or the combination of these two elements, shall be such as to leave an adequate margin for the operating period and the temperatures expected; in each case the system shall be deemed acceptable by a recognized classification society and shall ensure safety for a minimum time of three times the operation period;
- (c) other systems deemed acceptable by a recognized classification society.

9.3.1.24.2 The systems prescribed in 9.3.1.24.1 shall be constructed, installed and tested to the satisfaction of the recognized classification society. The materials used in their construction shall be compatible with the cargoes to be carried. For normal service, the upper ambient design temperature limits shall be:

air: +30° C;

water: +20° C.

9.3.1.24.3 The cargo storage system shall be capable of resisting the full vapour pressure of the cargo at the upper limits of the ambient design temperatures, whatever the system adopted to deal with the boil-off gas. This requirement is indicated by remark 37 in column (20) of Table C of Chapter 3.2.

9.3.1.25 *Pumps and piping*

9.3.1.25.1 Pumps, compressors and accessory loading and unloading piping shall be placed in the cargo area. Cargo pumps and compressors shall be capable of being shut down from the cargo area and, in addition, from a position outside the cargo area. Cargo pumps and compressors situated on deck shall be located not less than 6.00 m from entrances to, or openings of, the accommodation and service spaces outside the cargo area.

- 9.3.1.25.2
- (a) Pipes for loading and unloading shall be independent of any other piping of the vessel. No cargo piping shall be located below deck, except those inside the cargo tanks and in the service spaces intended for the installation of the vessel's own gas discharging system.
 - (b) *(Reserved)*
 - (c) Pipes for loading and unloading shall be clearly distinguishable from other piping, e.g. by means of colour marking.
 - (d) The pipes for loading and unloading on deck, the vapour pipes with the exception of the shore connections but including the safety valves, and the valves shall be located within the longitudinal line formed by the outer boundaries of the domes and not less than one quarter of the vessel's breadth from the outer shell. This requirement does not apply to the relief pipes situated behind the safety valves. If there is, however, only one dome athwartships, these pipes and their valves shall be located at a distance not less than 2.70 m from the shell.

Where cargo tanks are placed side by side, all the connections to the domes shall be located on the inner side of the domes. The external connections may be located on the fore and aft centre line of the dome. The shut-off devices shall be located directly at the dome or as close as possible to it. The shut-off devices of the loading and unloading piping shall be duplicated, one of the devices being constituted by a remote-controlled quick-action stop device. When the inside diameter of a shut-off device is less than 50 mm this device may be regarded as a safety device against bursts in the piping.

- (e) The shore connections shall be located not less than 6.00 m from the entrances to or openings of, the accommodation and service spaces outside the cargo area.
- (f) Each shore connection of the vapour pipe and shore connections of the pipes for loading and unloading, through which the loading or unloading operation is carried out, shall be fitted with a shut-off device and a quick-action stop valve. However, each shore connection shall be fitted with a blind flange when it is not in operation.

- (g) Pipes for loading and unloading, and vapour pipes, shall not have flexible connections fitted with sliding seals.

9.3.1.25.3 The distance referred to in 9.3.1.25.1 and 9.3.1.25.2 (e) may be reduced to 3.00 m if a transverse bulkhead complying with 9.3.1.10.2 is situated at the end of the cargo area. The openings shall be provided with doors.

The following notice shall be displayed on the doors:

**Do not open during loading and unloading without
the permission of the master.
Close immediately.**

9.3.1.25.4 Every component of the pipes for loading and unloading shall be electrically connected to the hull.

9.3.1.25.5 The stop valves or other shut-off devices of the pipes for loading and unloading shall indicate whether they are open or shut.

9.3.1.25.6 The pipes for loading and unloading shall have, at the test pressure, the required elasticity, leakproofness and resistance to pressure.

9.3.1.25.7 The pipes for unloading shall be fitted with pressure gauges at the inlet and outlet of the pump.

Reading of the pressure gauges shall be possible from the control position of the vessel's own gas discharging system. The maximum permissible overpressure or vacuum shall be indicated by a red mark.

Readings shall be possible in all weather conditions.

9.3.1.25.8 Use of the cargo piping for ballasting purposes shall not be possible.

9.3.1.26 *(Reserved)*

9.3.1.27 *Refrigeration system*

9.3.1.27.1 The refrigeration system referred to in 9.3.1.24.1 (a) shall be composed of one or more units capable of keeping the pressure and temperature of the cargo at the upper limits of the ambient design temperatures at the prescribed level. Unless another means of regulating cargo pressure and temperature deemed satisfactory by a recognized classification society is provided, provision shall be made for one or more stand-by units with an output at least equal to that of the largest prescribed unit. A stand-by unit shall include a compressor, its engine, its control system and all necessary accessories to enable it to operate independently of the units normally used. Provision shall be made for a stand-by heat-exchanger unless the system's normal heat-exchanger has a surplus capacity equal to at least 25% of the largest prescribed capacity. It is not necessary to make provision for separate piping.

Cargo tanks, piping and accessories shall be insulated so that, in the event of a failure of all cargo refrigeration systems, the entire cargo remains for at least 52 hours in a condition not causing the safety valves to open.

9.3.1.27.2 The security devices and the connecting lines from the refrigeration system shall be connected to the cargo tanks above the liquid phase of the cargo when the tanks are filled to

their maximum permissible degree of filling. They shall remain within the gaseous phase, even if the vessel has a list up to 12 degrees.

- 9.3.1.27.3 When several refrigerated cargoes with a potentially dangerous chemical reaction are carried simultaneously, particular care shall be given to the refrigeration systems so as to prevent any mixing of the cargoes. For the carriage of such cargoes, separate refrigeration systems, each including the full stand-by unit referred to in 9.3.1.27.1, shall be provided for each cargo. When, however, refrigeration is ensured by an indirect or combined system and no leak in the heat exchangers can under any foreseeable circumstances lead to the mixing of cargoes, no provision need be made for separate refrigeration units for the different cargoes.
- 9.3.1.27.4 When several refrigerated cargoes are not soluble in each other under conditions of carriage such that their vapour pressures are added together in the event of mixing, particular care shall be given to the refrigeration systems to prevent any mixing of the cargoes.
- 9.3.1.27.5 When the refrigeration systems require water for cooling, a sufficient quantity shall be supplied by a pump or pumps used exclusively for the purpose. This pump or pumps shall have at least two suction pipes, leading from two water intakes, one to port, the other to starboard. Provision shall be made for a stand-by pump with a satisfactory flow; this may be a pump used for other purposes provided that its use for supplying water for cooling does not impair any other essential service.
- 9.3.1.27.6 The refrigeration system may take one of the following forms:
- (a) Direct system: the cargo vapours are compressed, condensed and returned to the cargo tanks. This system shall not be used for certain cargoes specified in Table C of Chapter 3.2. This requirement is indicated by remark 35 in column (20) of Table C of Chapter 3.2;
 - (b) Indirect system: the cargo or the cargo vapours are cooled or condensed by means of a coolant without being compressed;
 - (c) Combined system: the cargo vapours are compressed and condensed in a cargo/coolant heat-exchanger and returned to the cargo tanks. This system shall not be used for certain cargoes specified in Table C of Chapter 3.2. This requirement is indicated by remark 36 in column (20) of Table C of Chapter 3.2.
- 9.3.1.27.7 All primary and secondary coolant fluids shall be compatible with each other and with the cargo with which they may come into contact. Heat exchange may take place either at a distance from the cargo tank, or by using cooling coils attached to the inside or the outside of the cargo tank.
- 9.3.1.27.8 When the refrigeration system is installed in a separate service space, this service space shall meet the requirements of 9.3.1.17.6.
- 9.3.1.27.9 For all cargo systems, the heat transmission coefficient shall be determined by calculation. The correctness of the calculation shall be checked by means of a refrigeration test (heat balance test).
- This test shall be performed in accordance with the rules set up by a recognised classification society.
- 9.3.1.27.10 A certificate from a recognized classification society stating that 9.3.1.24.1 to 9.3.1.24.3, 9.2.1.27.1 and 9.3.1.27.4 above have been complied with shall be submitted together with the application for issue or renewal of the certificate of approval.

9.3.1.28 *Water-spray system*

When water-spraying is required in column (9) of Table C of Chapter 3.2 a water-spray system shall be installed in the cargo area on deck for the purpose of reducing gases given off by the cargo by spraying water.

The system shall be fitted with a connection device for supply from the shore. The spray nozzles shall be so installed that released gases are precipitated safely. The system shall be capable of being put into operation from the wheelhouse and from the deck. The capacity of the water-spray system shall be such that when all the spray nozzles are in operation, the outflow is of 50 litres per square metre of cargo deck area and per hour.

9.3.1.29-
9.3.1.30 (*Reserved*)

9.3.1.31 *Engines*

9.3.1.31.1 Only internal combustion engines running on fuel with a flashpoint of more than 55 °C are allowed.

9.3.1.31.2 Ventilation inlets of the engine room and, when the engines do not take in air directly from the engine room, the air intakes of the engines shall be located not less than 2.00 m from the cargo area.

9.3.1.31.3 Sparking shall not be possible within the cargo area.

9.3.1.31.4 The surface temperature of the outer parts of engines used during loading or unloading operations, as well as that of their air inlets and exhaust ducts shall not exceed the allowable temperature according to the temperature class of the substances carried. This provision does not apply to engines installed in service spaces provided the provisions of 9.3.1.52.3 are fully complied with.

9.3.1.31.5 The ventilation in the closed engine room shall be designed so that, at an ambient temperature of 20 °C, the average temperature in the engine room does not exceed 40 °C.

9.3.1.32 *Oil fuel tanks*

9.3.1.32.1 When the vessel is fitted with hold spaces and double bottoms, double bottoms within the cargo area may be arranged as oil fuel tanks, provided their depth is not less than 0.6 m.

Oil fuel pipes and openings of such tanks are not permitted in the hold space.

9.3.1.32.2 Open ends of air pipes of all oil fuel tanks shall extend to not less than 0.5 m above the open deck. The open ends and the open ends of overflow pipes leading on the deck shall be fitted with a protective device consisting of a gauze diaphragm or a perforated plate.

9.3.1.33 (*Reserved*)

9.3.1.34 *Exhaust pipes*

9.3.1.34.1 Exhausts shall be evacuated from the vessel into the open air either upwards through an exhaust pipe or through the shell plating. The exhaust outlet shall be located not less than 2 m from the cargo area. The exhaust pipes of engines shall be arranged so that the exhausts are led away from the vessel. The exhaust pipes shall not be located within the cargo area.

9.3.1.34.2 Exhaust pipes of engines shall be provided with a device preventing the escape of sparks, e.g. spark arresters.

9.3.1.35 *Bilge pumping and ballasting arrangements*

9.3.1.35.1 Bilge and ballast pumps for spaces within the cargo area shall be installed within such area.

This provision does not apply to:

- double-hull spaces and double bottoms which do not have a common boundary wall with the cargo tanks;
- cofferdams and hold spaces where ballasting is carried out using the piping of the fire-fighting system in the cargo area and bilge-pumping is performed using educators.

9.3.1.35.2 Where the double bottom is used as a liquid oil fuel tank, it shall not be connected to the bilge piping system.

9.3.1.35.3 Where the ballast pump is installed in the cargo area, the standpipe and its outboard connection for suction of ballast water shall be located within the cargo area.

9.3.1.35.4 It shall be possible for an under-deck pump-room to be stripped in an emergency using a system located in the cargo area and independent of any other system. This stripping system shall be located outside the pump-room.

9.3.1.36-
9.3.1.39 (*Reserved*)

9.3.1.40 *Fire-extinguishing arrangements*

9.3.1.40.1 A fire-extinguishing system shall be installed on the vessel.

This system shall comply with the following requirements:

- It shall be supplied by two independent fire or ballast pumps, one of which shall be ready for use at any time. These pumps and their means of propulsion and electrical equipment shall not be installed in the same space;
- It shall be provided with a water main fitted with at least three hydrants in the cargo area above deck. Three suitable and sufficiently long hoses with spray nozzles having a diameter of not less than 12 mm shall be provided. It shall be possible to reach any point of the deck in the cargo area simultaneously with at least two jets of water which do not emanate from the same hydrant.

A spring-loaded non-return valve shall be fitted to ensure that no gases can escape through the fire-extinguishing system into the accommodation or service spaces outside the cargo area;

- The capacity of the system shall be at least sufficient for a jet of water to have a minimum reach of not less than the vessel's breadth from any location on board with two spray nozzles being used at the same time.

9.3.1.40.2 In addition the engine rooms, the cargo pump-room and all spaces containing special equipment (switchboards, compressors, etc.) for the refrigerant equipment if any, shall be provided with a permanently fixed fire-extinguishing system meeting the following requirements:

9.3.1.40.2.1 *Extinguishing agents*

For the protection of spaces in engine rooms, boiler rooms and pump rooms, only permanently fixed fire-extinguishing systems using the following extinguishing agents are permitted:

- (a) CO₂ (carbon dioxide);
- (b) HFC 227 ea (heptafluoropropane);
- (c) IG-541 (52% nitrogen, 40% argon, 8% carbon dioxide).
- (d) FK-5-1-12 (dodecafluoro 2-methylpentane-3-one).

Other extinguishing agents are permitted only on the basis of recommendations by the Administrative Committee.

9.3.1.40.2.2 *Ventilation, air extraction*

- (a) The combustion air required by the combustion engines which ensure propulsion should not come from spaces protected by permanently fixed fire-extinguishing systems. This requirement is not mandatory if the vessel has two independent main engine rooms with a gastight separation or if, in addition to the main engine room, there is a separate engine room installed with a bow thruster that can independently ensure propulsion in the event of a fire in the main engine room.
- (b) All forced ventilation systems in the space to be protected shall be shut down automatically as soon as the fire-extinguishing system is activated.
- (c) All openings in the space to be protected which permit air to enter or gas to escape shall be fitted with devices enabling them to be closed rapidly. It shall be clear whether they are open or closed.
- (d) Air escaping from the pressure-relief valves of the pressurised air tanks installed in the engine rooms shall be evacuated to the open air.
- (e) Overpressure or negative pressure caused by the diffusion of the extinguishing agent shall not destroy the constituent elements of the space to be protected. It shall be possible to ensure the safe equalisation of pressure.
- (f) Protected spaces shall be provided with a means of extracting the extinguishing agent. If extraction devices are installed, it shall not be possible to start them up during extinguishing.

9.3.1.40.2.3 *Fire alarm system*

The space to be protected shall be monitored by an appropriate fire alarm system. The alarm signal shall be audible in the wheelhouse, the accommodation and the space to be protected.

9.3.1.40.2.4 *Piping system*

- (a) The extinguishing agent shall be routed to and distributed in the space to be protected by means of a permanent piping system. Piping installed in the space to be protected and the reinforcements it incorporates shall be made of steel. This shall not apply to

the connecting nozzles of tanks and compensators provided that the materials used have equivalent fire-retardant properties. Piping shall be protected against corrosion both internally and externally.

- (b) The discharge nozzles shall be so arranged as to ensure the regular diffusion of the extinguishing agent. In particular, the extinguishing agent must also be effective beneath the floor.

9.3.1.40.2.5 *Triggering device*

- (a) Automatically activated fire-extinguishing systems are not permitted.
- (b) It shall be possible to activate the fire-extinguishing system from a suitable point located outside the space to be protected.
- (c) Triggering devices shall be so installed that they can be activated in the event of a fire and so that the risk of their breakdown in the event of a fire or an explosion in the space to be protected is reduced as far as possible.

Systems which are not mechanically activated shall be supplied from two energy sources independent of each other. These energy sources shall be located outside the space to be protected. The control lines located in the space to be protected shall be so designed as to remain capable of operating in the event of a fire for a minimum of 30 minutes. The electrical installations are deemed to meet this requirement if they conform to the IEC 60331-21:1999 standard.

When the triggering devices are so placed as not to be visible, the component concealing them shall carry the "Fire-fighting system" symbol, each side being not less than 10 cm in length, with the following text in red letters on a white ground:

Fire-extinguishing system

- (d) If the fire-extinguishing system is intended to protect several spaces, it shall comprise a separate and clearly-marked triggering device for each space.
- (e) The instructions shall be posted alongside all triggering devices and shall be clearly visible and indelible. The instructions shall be in a language the master can read and understand and if this language is not English, French or German, they shall be in English, French or German. They shall include information concerning:
 - (i) the activation of the fire-extinguishing system;
 - (ii) the need to ensure that all persons have left the space to be protected;
 - (iii) The correct behaviour of the crew in the event of activation and when accessing the space to be protected following activation or diffusion, in particular in respect of the possible presence of toxic substances;
 - (iv) the correct behaviour of the crew in the event of the failure of the fire-extinguishing system to function properly.
- (f) The instructions shall mention that prior to the activation of the fire-extinguishing system, combustion engines installed in the space and aspirating air from the space to be protected, shall be shut down.

9.3.1.40.2.6 *Alarm device*

- (a) Permanently fixed fire-extinguishing systems shall be fitted with an audible and visual alarm device.
- (b) The alarm device shall be set off automatically as soon as the fire-extinguishing system is first activated. The alarm device shall function for an appropriate period of time before the extinguishing agent is released; it shall not be possible to turn it off.
- (c) Alarm signals shall be clearly visible in the spaces to be protected and their access points and be clearly audible under operating conditions corresponding to the highest possible sound level. It shall be possible to distinguish them clearly from all other sound and visual signals in the space to be protected.
- (d) Sound alarms shall also be clearly audible in adjoining spaces, with the communicating doors shut, and under operating conditions corresponding to the highest possible sound level.
- (e) If the alarm device is not intrinsically protected against short circuits, broken wires and drops in voltage, it shall be possible to monitor its operation.
- (f) A sign with the following text in red letters on a white ground shall be clearly posted at the entrance to any space the extinguishing agent may reach:

Warning, fire-extinguishing system!
Leave this space immediately when the ... (description) alarm is activated!

9.3.1.40.2.7 *Pressurised tanks, fittings and piping*

- (a) Pressurised tanks, fittings and piping shall conform to the requirements of the competent authority.
- (b) Pressurised tanks shall be installed in accordance with the manufacturer's instructions.
- (c) Pressurised tanks, fittings and piping shall not be installed in the accommodation.
- (d) The temperature of cabinets and storage spaces for pressurised tanks shall not exceed 50 °C.
- (e) Cabinets or storage spaces on deck shall be securely stowed and shall have vents so placed that in the event of a pressurised tank not being gastight, the escaping gas cannot penetrate into the vessel. Direct connections with other spaces are not permitted.

9.3.1.40.2.8 *Quantity of extinguishing agent*

If the quantity of extinguishing agent is intended for more than one space, the quantity of extinguishing agent available does not need to be greater than the quantity required for the largest of the spaces thus protected.

9.3.1.40.2.9 *Installation, maintenance, monitoring and documents*

- (a) The mounting or modification of the system shall only be performed by a company specialised in fire-extinguishing systems. The instructions (product data sheet, safety

data sheet) provided by the manufacturer of the extinguishing agent or the system shall be followed.

- (b) The system shall be inspected by an expert:
 - (i) before being brought into service;
 - (ii) each time it is put back into service after activation;
 - (iii) after every modification or repair;
 - (iv) regularly, not less than every two years.
- (c) During the inspection, the expert is required to check that the system conforms to the requirements of 9.3.1.40.2.
- (d) The inspection shall include, as a minimum:
 - (i) an external inspection of the entire system;
 - (ii) an inspection to ensure that the piping is leakproof;
 - (iii) an inspection to ensure that the control and activation systems are in good working order;
 - (iv) an inspection of the pressure and contents of tanks;
 - (v) an inspection to ensure that the means of closing the space to be protected are leakproof;
 - (vi) an inspection of the fire alarm system;
 - (vii) an inspection of the alarm device.
- (e) The person performing the inspection shall establish, sign and date a certificate of inspection.
- (f) The number of permanently fixed fire-extinguishing systems shall be mentioned in the inspection certificate.

9.3.1.40.2.10 *Fire-extinguishing system operating with CO₂*

In addition to the requirements contained in 9.3.1.40.2.1 to 9.3.1.40.2.9, fire-extinguishing systems using CO₂ as an extinguishing agent shall conform to the following provisions:

- (a) Tanks of CO₂ shall be placed in a gastight space or cabinet separated from other spaces. The doors of such storage spaces and cabinets shall open outwards; they shall be capable of being locked and shall carry on the outside the symbol “Warning: general danger”, not less than 5 cm high and “CO₂” in the same colours and the same size;
- (b) Storage cabinets or spaces for CO₂ tanks located below deck shall only be accessible from the outside. These spaces shall have an artificial ventilation system with extractor hoods and shall be completely independent of the other ventilation systems on board;

- (c) The level of filling of CO₂ tanks shall not exceed 0.75 kg/l. The volume of depressurised CO₂ shall be taken to be 0.56 m³/kg;
- (d) The concentration of CO₂ in the space to be protected shall be not less than 40% of the gross volume of the space. This quantity shall be released within 120 seconds. It shall be possible to monitor whether diffusion is proceeding correctly;
- (e) The opening of the tank valves and the control of the diffusing valve shall correspond to two different operations;
- (f) The appropriate period of time mentioned in 9.3.1.40.2.6 (b) shall be not less than 20 seconds. A reliable installation shall ensure the timing of the diffusion of CO₂.

9.3.1.40.2.11 *Fire-extinguishing system operating with HFC-227 ea (heptafluoropropane)*

In addition to the requirements of 9.3.1.40.2.1 to 9.3.1.40.2.9, fire-extinguishing systems using HFC-227 ea as an extinguishing agent shall conform to the following provisions:

- (a) Where there are several spaces with different gross volumes, each space shall be equipped with its own fire-extinguishing system;
- (b) Every tank containing HFC-227 ea placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of the tank are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;
- (c) Every tank shall be fitted with a device permitting control of the gas pressure;
- (d) The level of filling of tanks shall not exceed 1.15 kg/l. The specific volume of depressurised HFC-227 ea shall be taken to be 0.1374 m³/kg;
- (e) The concentration of HFC-227 ea in the space to be protected shall be not less than 8% of the gross volume of the space. This quantity shall be released within 10 seconds;
- (f) Tanks of HFC-227 ea shall be fitted with a pressure monitoring device which triggers an audible and visual alarm in the wheelhouse in the event of an unscheduled loss of propellant gas. Where there is no wheelhouse, the alarm shall be triggered outside the space to be protected;
- (g) After discharge, the concentration in the space to be protected shall not exceed 10.5% (volume);
- (h) The fire-extinguishing system shall not comprise aluminium parts.

9.3.1.40.2.12 *Fire-extinguishing system operating with IG-541*

In addition to the requirements of 9.3.1.40.2.1 to 9.3.1.40.2.9, fire-extinguishing systems using IG-541 as an extinguishing agent shall conform to the following provisions:

- (a) Where there are several spaces with different gross volumes, every space shall be equipped with its own fire-extinguishing system;
- (b) Every tank containing IG-541 placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of the tank

are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;

- (c) Each tank shall be fitted with a device for checking the contents;
- (d) The filling pressure of the tanks shall not exceed 200 bar at a temperature of +15 °C;
- (e) The concentration of IG-541 in the space to be protected shall be not less than 44% and not more than 50% of the gross volume of the space. This quantity shall be released within 120 seconds.

9.3.1.40.2.13 *Fire-extinguishing system operating with FK-5-1-12*

In addition to the requirements of 9.3.1.40.2.1 to 9.3.1.40.2.9, fire-extinguishing systems using FK-5-1-12 as an extinguishing agent shall comply with the following provisions:

- (a) Where there are several spaces with different gross volumes, every space shall be equipped with its own fire-extinguishing system;
- (b) Every tank containing FK-5-1-12 placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of the tank are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;
- (c) Every tank shall be fitted with a device permitting control of the gas pressure;
- (d) The level of filling of tanks shall not exceed 1.00 kg/l. The specific volume of depressurized FK-5-1-12 shall be taken to be 0.0719 m³/kg;
- (e) The volume of FK-5-1-12 in the space to be protected shall be not less than 5.5% of the gross volume of the space. This quantity shall be released within 10 seconds;
- (f) Tanks of FK-5-1-12 shall be fitted with a pressure monitoring device which triggers an audible and visual alarm in the wheelhouse in the event of an unscheduled loss of extinguishing agent. Where there is no wheelhouse, the alarm shall be triggered outside the space to be protected;
- (g) After discharge, the concentration in the space to be protected shall not exceed 10.0%.

9.3.1.40.2.14 *Fixed fire-extinguishing system for physical protection*

In order to ensure physical protection in the engine rooms, boiler rooms and pump rooms, permanently fixed fire-extinguishing systems are accepted solely on the basis of recommendations by the Administrative Committee.

9.3.1.40.3 The two hand fire-extinguishers referred to in 8.1.4 shall be located in the cargo area.

9.3.1.40.4 The fire-extinguishing agent and the quantity contained in the permanently fixed fire-extinguishing system shall be suitable and sufficient for fighting fires.

9.3.1.41 *Fire and naked light*

9.3.1.41.1 The outlets of funnels shall be located not less than 2.00 m from the cargo area. Arrangements shall be provided to prevent the escape of sparks and the entry of water.

9.3.1.41.2 Heating, cooking and refrigerating appliances shall not be fuelled with liquid fuels, liquid gas or solid fuels.

The installation in the engine room or in another separate space of heating appliances fuelled with liquid fuel having a flash-point above 55 °C is, however, permitted.

Cooking and refrigerating appliances are permitted only in the accommodation.

9.3.1.41.3 Only electrical lighting appliances are permitted.

9.3.1.42- (Reserved)

9.3.1.49

9.3.1.50 Documents concerning electrical installations

9.3.1.50.1 In addition to the documents required by the Regulations referred to in 1.1.4.6, the following documents shall be on board:

(a) a drawing indicating the boundaries of the cargo area and the location of the electrical equipment installed in this area;

(b) a list of the electrical equipment referred to in (a) above including the following particulars:

machine or appliance, location, type of protection, type of protection against explosion, testing body and approval number;

(c) a list of or general plan indicating the electrical equipment outside the cargo area which may be operated during loading, unloading or gas-freeing. All other electrical equipment shall be marked in red. See 9.3.1.52.3 and 9.3.1.52.4.

9.3.1.50.2 The documents listed above shall bear the stamp of the competent authority issuing the certificate of approval.

9.3.1.51 Electrical installations

9.3.1.51.1 Only distribution systems without return connection to the hull are permitted.

This provision does not apply to:

- active cathodic corrosion protection;
- local installations outside the cargo area (e.g. connections of starters of diesel engines);
- the device for checking the insulation level referred to in 9.3.1.51.2 below.

9.3.1.51.2 Every insulated distribution network shall be fitted with an automatic device with a visual and audible alarm for checking the insulation level.

9.3.1.51.3 For the selection of electrical equipment to be used in zones presenting an explosion risk, the explosion groups and temperature classes assigned to the substances carried in the list of substances shall be taken into consideration (See columns (15) and (16) of Table C of Chapter 3.2).

9.3.1.52 *Type and location of electrical equipment*

- 9.3.1.52.1 (a) Only the following equipment may be installed in cargo tanks and pipes for loading and unloading (comparable to zone 0):
- measuring, regulation and alarm devices of the EEx (ia) type of protection.
- (b) Only the following equipment may be installed in the cofferdams, double-hull spaces, double bottoms and hold spaces (comparable to zone 1):
- measuring, regulation and alarm devices of the certified safe type;
 - lighting appliances of the “flame-proof enclosure” or “apparatus protected by pressurization” type of protection;
 - hermetically sealed echo sounding devices the cables of which are led through thick-walled steel tubes with gastight connections up to the main deck;
 - cables for the active cathodic protection of the shell plating in protective steel tubes such as those provided for echo sounding devices.
- (c) Only the following equipment may be installed in the service spaces in the cargo area below deck (comparable to zone 1):
- measuring, regulation and alarm devices of the certified safe type;
 - lighting appliances of the “flame-proof enclosure” or “apparatus protected by pressurization” type of protection;
 - motors driving essential equipment such as ballast pumps; they shall be of the certified safe type.
- (d) The control and protective equipment of the electrical equipment referred to in (a), (b) and (c) above shall be located outside the cargo area if they are not intrinsically safe.
- (e) The electrical equipment in the cargo area on deck (comparable to zone 1) shall be of the certified safe type.
- 9.3.1.52.2 Accumulators shall be located outside the cargo area.
- 9.3.1.52.3 (a) Electrical equipment used during loading, unloading and gas-freeing during berthing and which are located outside the cargo area (comparable to zone 2) shall be at least of the “limited explosion risk” type.
- (b) This provision does not apply to:
- (i) lighting installations in the accommodation, except for switches near entrances to accommodation;
 - (ii) radiotelephone installations in the accommodation or the wheelhouse;
 - (iii) mobile and fixed telephone installations in the accommodation or the wheelhouse;
 - (iv) electrical installations in the accommodation, the wheelhouse or the service spaces outside the cargo areas if:

1. These spaces are fitted with a ventilation system ensuring an overpressure of 0.1 kPa (0.001 bar) and none of the windows is capable of being opened; the air intakes of the ventilation system located as far away as possible, however, not less than 6.00 m from the cargo area and not less than 2.00 m above the deck;
 2. The spaces are fitted with a gas detection system with sensors:
 - at the suction inlets of the ventilation system;
 - directly at the top edge of the sill of the entrance doors of the accommodation and service spaces;
 3. The gas concentration measurement is continuous;
 4. When the gas concentration reaches 20% of the lower explosive limit, the ventilators shall be switched off. In such a case and when the overpressure is not maintained or in the event of failure of the gas detection system, the electrical installations which do not comply with (a) above, shall be switched off. These operations shall be performed immediately and automatically and activate the emergency lighting in the accommodation, the wheelhouse and the service spaces, which shall comply at least with the “limited explosion risk” type. The switching-off shall be indicated in the accommodation and wheelhouse by visual and audible signals;
 5. The ventilation system, the gas detection system and the alarm of the switch-off device fully comply with the requirements of (a) above;
 6. The automatic switch-off device is set so that no automatic switching-off may occur while the vessel is under way.
- 9.3.1.52.4 The electrical equipment which does not meet the requirements set out in 9.3.1.52.3 above together with its switches shall be marked in red. The disconnection of such equipment shall be operated from a centralised location on board.
- 9.3.1.52.5 An electric generator which is permanently driven by an engine and which does not meet the requirements of 9.3.1.52.3 above, shall be fitted with a switch capable of shutting down the excitation of the generator. A notice board with the operating instructions shall be displayed near the switch.
- 9.3.1.52.6 Sockets for the connection of signal lights and gangway lighting shall be permanently fitted to the vessel close to the signal mast or the gangway. Connecting and disconnecting shall not be possible except when the sockets are not live.
- 9.3.1.52.7 The failure of the power supply for the safety and control equipment shall be immediately indicated by visual and audible signals at the locations where the alarms are usually actuated.
- 9.3.1.53** *Earthing*
- 9.3.1.53.1 The metal parts of electrical appliances in the cargo area which are not live as well as protective metal tubes or metal sheaths of cables in normal service shall be earthed, unless they are so arranged that they are automatically earthed by bonding to the metal structure of the vessel.

- 9.3.1.53.2 The provisions of 9.3.1.53.1 above apply also to equipment having service voltages of less than 50 V.
- 9.3.1.53.3 Independent cargo tanks shall be earthed.
- 9.3.1.53.4 Metal intermediate bulk containers (IBCs) and tank-containers, used as residual cargo tanks or slop tanks, shall be capable of being earthed.

9.3.1.54-
9.3.1.55 (*Reserved*)

9.3.1.56 *Electrical cables*

- 9.3.1.56.1 All cables in the cargo area shall have a metallic sheath.
- 9.3.1.56.2 Cables and sockets in the cargo area shall be protected against mechanical damage.
- 9.3.1.56.3 Movable cables are prohibited in the cargo area, except for intrinsically safe electric circuits or for the supply of signal lights and gangway lighting.
- 9.3.1.56.4 Cables of intrinsically safe circuits shall only be used for such circuits and shall be separated from other cables not intended for being used in such circuits (e.g. they shall not be installed together in the same string of cables and they shall not be fixed by the same cable clamps).
- 9.3.1.56.5 For movable cables intended for signal lights and gangway lighting, only sheathed cables of type H 07 RN-F in accordance with standard IEC 60 245-4:1994 or cables of at least equivalent design having conductors with a cross-section of not less than 1.5 mm² shall be used.
- These cables shall be as short as possible and installed so that damage is not likely to occur.
- 9.3.1.56.6 The cables required for the electrical equipment referred to in 9.3.1.52.1 (b) and (c) are accepted in cofferdams, double-hull spaces, double bottoms, hold spaces and service spaces below deck.

9.3.1.57-
9.3.1.59 (*Reserved*)

9.3.1.60 *Special equipment*

A shower and an eye and face bath shall be provided on the vessel at a location which is directly accessible from the cargo area.

9.3.1.61-
9.3.1.70 (*Reserved*)

9.3.1.71 *Admittance on board*

The notice boards displaying the prohibition of admittance in accordance with 8.3.3 shall be clearly legible from either side of the vessel.

9.3.1.72-
9.3.1.73 (*Reserved*)

9.3.1.74 *Prohibition of smoking, fire or naked light*

9.3.1.74.1 The notice boards displaying the prohibition of smoking in accordance with 8.3.4 shall be clearly legible from either side of the vessel.

9.3.1.74.2 Notice boards indicating the circumstances under which the prohibition is applicable shall be fitted near the entrances to the spaces where smoking or the use of fire or naked light is not always prohibited.

9.3.1.74.3 Ashtrays shall be provided close to each exit of the accommodation and the wheelhouse.

9.3.1.75-
9.3.1.91 (*Reserved*)

9.3.1.92 *Emergency exit*

Spaces the entrances or exits of which are likely to become partly or completely immersed in the damaged condition shall have an emergency exit which is situated not less than 0.10 m above the damage waterline. This does not apply to forepeak and afterpeak.

9.3.1.93-
9.3.1.99 (*Reserved*)

9.3.2 *Rules for construction of type C tank vessels*

The rules for construction of 9.3.2.0 to 9.3.2.99 apply to type C tank vessels.

9.3.2.0 *Materials of construction*

9.3.2.0.1 (a) The vessel's hull and the cargo tanks shall be constructed of shipbuilding steel or other at least equivalent metal.

The independent cargo tanks may also be constructed of other materials, provided these have at least equivalent mechanical properties and resistance against the effects of temperature and fire.

(b) Every part of the vessel including any installation and equipment which may come into contact with the cargo shall consist of materials which can neither be dangerously affected by the cargo nor cause decomposition of the cargo or react with it so as to form harmful or hazardous products.

(c) Vapour pipes and gas discharge pipes shall be protected against corrosion.

9.3.2.0.2 Except where explicitly permitted in 9.3.2.0.3 below or in the certificate of approval, the use of wood, aluminium alloys or plastic materials within the cargo area is prohibited.

9.3.2.0.3 (a) The use of wood, aluminium alloys or plastic materials within the cargo area is only permitted for:

- gangways and external ladders;
- movable items of equipment (aluminium gauging rods are, however permitted, provided that they are fitted with brass feet or protected in another way to avoid sparking);

- chocking of cargo tanks which are independent of the vessel's hull and chocking of installations and equipment;
- masts and similar round timber;
- engine parts;
- parts of the electrical installation;
- loading and unloading appliances;
- lids of boxes which are placed on the deck.

(b) The use of wood or plastic materials within the cargo area is only permitted for:

- supports and stops of any kind.

(c) The use of plastic materials or rubber within the cargo area is only permitted for:

- coating of cargo tanks and of pipes for loading and unloading;
- all kinds of gaskets (e.g. for dome or hatch covers);
- electric cables;
- hoses for loading and unloading;
- insulation of cargo tanks and of hoses for loading and unloading.

(d) All permanently fitted materials in the accommodation or wheelhouse, with the exception of furniture, shall not readily ignite. They shall not evolve fumes or toxic gases in dangerous quantities, if involved in a fire.

9.3.2.0.4 The paint used in the cargo area shall not be liable to produce sparks in case of impact.

9.3.2.0.5 The use of plastic material for vessel's boats is permitted only if the material does not readily ignite.

9.3.2.1-
9.3.2.7 (*Reserved*)

9.3.2.8 *Classification*

9.3.2.8.1 The tank vessel shall be built under survey of a recognised classification society in accordance with the rules established by that classification society for its highest class, and the tank vessel shall be classed accordingly.

The vessel's highest class shall be continued.

The classification society shall issue a certificate certifying that the vessel is in conformity with the rules of this section.

The design pressure and the test pressure of cargo tanks shall be entered in the certificate.

If a vessel has cargo tanks with different valve opening pressures, the design and test pressures of each tank shall be entered in the certificate.

The classification society shall draw up a certificate mentioning all the dangerous goods accepted for carriage by the vessel (see also 1.16.1.2.5).

9.3.2.8.2 The cargo pump-rooms shall be inspected by a recognised classification society whenever the certificate of approval has to be renewed as well as during the third year of validity of the certificate of approval. The inspection shall comprise at least:

- an inspection of the whole system for its condition, for corrosion, leakage or conversion works which have not been approved;
- a checking of the condition of the gas detection system in the cargo pump-rooms.

Inspection certificates signed by the recognised classification society with respect to the inspection of the cargo pump-rooms shall be kept on board. The inspection certificates shall at least include particulars of the above inspection and the results obtained as well as the date of the inspection.

9.3.2.8.3 The condition of the gas detection system referred to in 9.3.2.52.3 shall be checked by a recognised classification society whenever the certificate of approval has to be renewed and during the third year of validity of the certificate of approval. A certificate signed by the recognised classification society shall be kept on board.

9.3.2.9 *(Reserved)*

9.3.2.10 *Protection against the penetration of gases*

9.3.2.10.1 The vessel shall be designed so as to prevent gases from penetrating into the accommodation and the service spaces.

9.3.2.10.2 Outside the cargo area, the lower edges of door-openings in the sidewalls of superstructures and the coamings of access hatches to under-deck spaces shall have a height of not less than 0.50 m above the deck.

This requirement need not be complied with if the wall of the superstructures facing the cargo area extends from one side of the ship to the other and has doors the sills of which have a height of not less than 0.50 m. The height of this wall shall be not less than 2.00 m. In this case, the lower edges of door-openings in the sidewalls of superstructures and of coamings of access hatches behind this wall shall have a height of not less than 0.10 m. The sills of engine-room doors and the coamings of its access hatches shall, however, always have a height of not less than 0.50 m.

9.3.2.10.3 In the cargo area, the lower edges of door-openings in the sidewalls of superstructures shall have a height of not less than 0.50 m above the deck and the sills of hatches and ventilation openings of premises located under the deck shall have a height of not less than 0.50 m above the deck. This requirement does not apply to access openings to double-hull and double bottom spaces.

9.3.2.10.4 The bulwarks, foot-rails, etc. shall be provided with sufficiently large openings which are located directly above the deck.

9.3.2.11 *Hold spaces and cargo tanks*

9.3.2.11.1 (a) The maximum permissible capacity of a cargo tank shall be determined in accordance with the following table:

$L \times B \times H$ (m ³)	Maximum permissible capacity of a cargo tank (m ³)
up to 600	$L \times B \times H \times 0.3$
600 to 3 750	$180 + (L \times B \times H - 600) \times 0.0635$
> 3 750	380

Alternative constructions in accordance with 9.3.4 are permitted.

In the table above $L \times B \times H$ is the product of the main dimensions of the tank vessel in metres (according to the measurement certificate), where:

L = overall length of the hull in m;

B = extreme breadth of the hull in m;

H = shortest vertical distance in m between the top of the keel and the lowest point of the deck at the side of the vessel (moulded depth) within the cargo area.

- (b) The relative density of the substances to be carried shall be taken into consideration in the design of the cargo tanks. The maximum relative density shall be indicated in the certificate of approval.
- (c) When the vessel is provided with pressure cargo tanks, these tanks shall be designed for a working pressure of 400 kPa (4 bar).
- (d) For vessels with a length of not more than 50.00 m, the length of a cargo tank shall not exceed 10.00 m; and

For vessels with a length of more than 50.00 m, the length of a cargo tank shall not exceed 0.20 l.

This provision does not apply to vessels with independent built-in cylindrical tanks having a length to diameter ratio ≤ 7 .

- 9.3.2.11.2 (a) In the cargo area (except cofferdams) the vessel shall be designed as a flush-deck double-hull vessel, with double-hull spaces and double bottoms, but without a trunk.

Cargo tanks independent of the vessels' hull and refrigerated cargo tanks may only be installed in a hold space which is bounded by double-hull spaces and double bottoms in accordance with 9.3.2.11.7 below. The cargo tanks shall not extend beyond the deck.

- (b) The cargo tanks independent of the vessel's hull shall be fixed so that they cannot float.
- (c) The capacity of a suction well shall be limited to not more than 0.10 m³.
- (d) Side-struts linking or supporting the load-bearing components of the sides of the vessel with the load-bearing components of the longitudinal walls of cargo tanks and side-struts linking the load-bearing components of the vessel's bottom with the tank-bottom are prohibited.
- (e) A local recess in the cargo deck, contained on all sides, with a depth greater than 0.1 m, designed to house the loading and unloading pump, is permitted if it fulfils the following conditions:
 - The recess shall not be greater than 1 m in depth.

- The recess shall be located not less than 6 m from entrances and openings to accommodation and service spaces outside the cargo area.
- The recess shall be located at a minimum distance from the side plating equal to one quarter of the vessel's breadth.
- All pipes linking the recess to the cargo tanks shall be fitted with shut-off devices fitted directly on the bulkhead.
- All the controls required for the equipment located in the recess shall be activated from the deck.
- If the recess is deeper than 0.5 m, it shall be provided with a permanent gas detection system which automatically indicates the presence of explosive gases by means of direct-measuring sensors and actuates a visual and audible alarm when the gas concentration has reached 20% of the lower explosion limit. The sensors of this system shall be placed at suitable positions at the bottom of the recess. Measurement shall be continuous.
- Visual and audible alarms shall be installed in the wheelhouse and on deck and, when the alarm is actuated, the vessel loading and unloading system shall be shut down. Failure of the gas detection system shall be immediately signalled in the wheelhouse and on deck by means of visual and audible alarms.
- It shall be possible to drain the recess using a system installed on deck in the cargo area and independent of any other system.
- The recess shall be provided with a level alarm device which activates the draining system and triggers a visual and audible alarm in the wheelhouse when liquid accumulates at the bottom.
- When the recess is located above the cofferdam, the engine room bulkhead shall have an 'A-60' fire protection insulation according to SOLAS 74, Chapter II-2, Regulation 3.
- When the cargo area is fitted with a water-spray system, electrical equipment located in the recess shall be protected against infiltration of water.
- Pipes connecting the recess to the hull shall not pass through the cargo tanks.

- 9.3.2.11.3
- (a) The cargo tanks shall be separated by cofferdams of at least 0.60 m in width from the accommodation, engine room and service spaces outside the cargo area below deck or, if there are no such accommodation, engine room and service spaces, from the vessel's ends. Where the cargo tanks are installed in a hold space, a space of not less than 0.50 m shall be provided between such tanks and the end bulkheads of the hold space. In this case an end bulkhead meeting at least the definition for Class "A-60" according to SOLAS 74, Chapter II-2, Regulation 3, shall be deemed equivalent to a cofferdam. For pressure cargo tanks, the 0.50 m distance may be reduced to 0.20 m.
 - (b) Hold spaces, cofferdams and cargo tanks shall be capable of being inspected.
 - (c) All spaces in the cargo area shall be capable of being ventilated. Means for checking their gas-free condition shall be provided.

- 9.3.2.11.4 The bulkheads bounding the cargo tanks, cofferdams and hold spaces shall be watertight. The cargo tanks and the bulkheads bounding the cargo area shall have no openings or penetrations below deck.

The bulkhead between the engine room and the cofferdam or service space in the cargo area or between the engine room and a hold space may be fitted with penetrations provided that they conform to the provisions of 9.3.2.1.7.5.

The bulkhead between the cargo tank and the cargo pump-room below deck may be fitted with penetrations provided that they conform to the provisions of 9.3.2.1.7.6. The bulkheads between the cargo tanks may be fitted with passages provided that the loading or unloading pipes are fitted with shut-off devices in the cargo tank from which they come. These shut-off devices shall be operable from the deck.

- 9.3.2.11.5 Double-hull spaces and double bottoms in the cargo area shall be arranged for being filled with ballast water only. Double bottoms may, however, be used as oil fuel tanks, provided they comply with the provisions of 9.3.2.32.

- 9.3.2.11.6 (a) A cofferdam, the centre part of a cofferdam or another space below deck in the cargo area may be arranged as a service space, provided the bulkheads bounding the service space extend vertically to the bottom. This service space shall only be accessible from the deck.
- (b) The service space shall be watertight with the exception of its access hatches and ventilation inlets.
- (c) No pipes for loading and unloading shall be fitted within the service space referred to under (a) above.

Pipes for loading and unloading may be fitted in the cargo pump-rooms below deck only when they conform to the provisions of 9.3.2.17.6.

- 9.3.2.11.7 For double-hull construction with the cargo tanks integrated in the vessel's structure, the distance between the side wall of the vessel and the longitudinal bulkhead of the cargo tanks shall be not less than 1.00 m. A distance of 0.80 m may however be permitted, provided that, compared with the scantling requirements specified in the rules for construction of a recognised classification society, the following reinforcements have been made:

- (a) 25% increase in the thickness of the deck stringer plate;
- (b) 15% increase in the side plating thickness;
- (c) Arrangement of a longitudinal framing system at the vessel's side, where depth of the longitudinals shall be not less than 0.15 m and the longitudinals shall have a face plate with the cross-sectional area of at least 7.0 cm².
- (d) The stringer or longitudinal framing systems shall be supported by web frames, and like bottom girders fitted with lightening holes, at a maximum spacing of 1.80 m. These distances may be increased if the longitudinals are strengthened accordingly.

When a vessel is built according to the transverse framing system, a longitudinal stringer system shall be arranged instead of (c) above. The distance between the longitudinal stringers shall not exceed 0.80 m and their depth shall be not less than 0.15 m, provided they are completely welded to the frames. The cross-sectional area of the facebar or faceplate shall be not less than 7.0 cm² as in (c) above. Where cut-outs are arranged in the stringer at

the connection with the frames, the web depth of the stringer shall be increased with the depth of cut-outs.

The mean depth of the double bottoms shall be not less than 0.70 m. It shall, however, never be less than 0.60 m.

The depth below the suction wells may be reduced to 0.50 m.

Alternative constructions in accordance with 9.3.4 are permitted.

9.3.2.11.8 When a vessel is built with cargo tanks located in a hold space or refrigerated cargo tanks, the distance between the double walls of the hold space shall be not less than 0.80 m and the depth of the double bottom shall be not less than 0.60 m.

9.3.2.11.9 Where service spaces are located in the cargo area under deck, they shall be arranged so as to be easily accessible and to permit persons wearing protective clothing and breathing apparatus to safely operate the service equipment contained therein. They shall be designed so as to allow injured or unconscious personnel to be removed from such spaces without difficulties, if necessary by means of fixed equipment.

9.3.2.11.10 Cofferdams, double-hull spaces, double bottoms, cargo tanks, hold spaces and other accessible spaces within the cargo area shall be arranged so that they may be completely inspected and cleaned in an appropriate manner. The dimensions of openings except for those of double-hull spaces and double bottoms which do not have a wall adjoining the cargo tanks shall be sufficient to allow a person wearing breathing apparatus to enter or leave the space without difficulties. These openings shall have a minimum cross-sectional area of 0.36 m² and a minimum side length of 0.50 m. They shall be designed so as to allow an injured or unconscious person to be removed from the bottom of such a space without difficulties, if necessary by means of fixed equipment. In these spaces the distance between the reinforcements shall not be less than 0.50 m. In double bottoms this distance may be reduced to 0.45 m.

Cargo tanks may have circular openings with a diameter of not less than 0.68 m.

9.3.2.12 *Ventilation*

9.3.2.12.1 Each hold space shall have two openings the dimensions and location of which shall be such as to permit effective ventilation of any part of the hold space. If there are no such openings, it shall be possible to fill the hold spaces with inert gas or dry air.

9.3.2.12.2 Double-hull spaces and double bottoms within the cargo area which are not arranged for being filled with ballast water, hold spaces and cofferdams shall be provided with ventilation systems.

9.3.2.12.3 Any service spaces located in the cargo area below deck shall be provided with a system of forced ventilation with sufficient power for ensuring at least 20 changes of air per hour based on the volume of the space.

The ventilation exhaust ducts shall extend down to 50 mm above the bottom of the service space. The air shall be supplied through a duct at the top of the service space. The air inlets shall be located not less than 2.00 m above the deck, at a distance of not less than 2.00 m from tank openings and 6.00 m from the outlets of safety valves.

The extension pipes, which may be necessary, may be of the hinged type.

9.3.2.12.4 Ventilation of accommodation and service spaces shall be possible.

9.3.2.12.5 Ventilators used in the cargo area shall be designed so that no sparks may be emitted on contact of the impeller blades with the housing and no static electricity may be generated.

9.3.2.12.6 Notice boards shall be fitted at the ventilation inlets indicating the conditions when they shall be closed. Any ventilation inlets of accommodation and service spaces leading outside shall be fitted with fire flaps. Such ventilation inlets shall be located not less than 2.00 m from the cargo area.

Ventilation inlets of service spaces in the cargo area may be located within such area.

9.3.2.12.7 The flame-arresters prescribed in 9.3.2.20.4, 9.3.2.22.4, 9.3.2.22.5 and 9.3.2.26.4 shall be of a type approved for this purpose by the competent authority.

9.3.2.13 *Stability (general)*

9.3.2.13.1 Proof of sufficient stability shall be furnished including for stability in damaged condition.

9.3.2.13.2 The basic values for the stability calculation - the vessel's lightweight and location of the centre of gravity - shall be determined either by means of an inclining experiment or by detailed mass and moment calculation. In the latter case the lightweight of the vessel shall be checked by means of a lightweight test with a tolerance limit of $\pm 5\%$ between the mass determined by calculation and the displacement determined by the draught readings.

9.3.2.13.3 Proof of sufficient intact stability shall be furnished for all stages of loading and unloading and for the final loading condition.

Floatability after damage shall be proved for the most unfavourable loading condition. For this purpose, calculated proof of sufficient stability shall be established for critical intermediate stages of flooding and for the final stage of flooding. Negative values of stability in intermediate stages of flooding may be accepted only if the continued range of curve of righting lever in damaged condition indicates adequate positive values of stability.

9.3.2.14 *Stability (intact)*

9.3.2.14.1 The requirements for intact stability resulting from the damage stability calculation shall be fully complied with.

9.3.2.14.2 For vessels with cargo tanks of more than 0.70 B in width, proof shall be furnished that the following stability requirements have been complied with:

- (a) In the positive area of the righting lever curve up to immersion of the first non-watertight opening there shall be a righting lever (GZ) of not less than 0.10 m;
- (b) The surface of the positive area of the righting lever curve up to immersion of the first non-watertight opening and in any event up to an angle of heel $\leq 27^\circ$ shall not be less than 0.024 m.rad;
- (c) The metacentric height (GM) shall be not less than 0.10 m.

These conditions shall be met bearing in mind the influence of all free surfaces in tanks for all stages of loading and unloading.

9.3.2.14.3 The most stringent requirement of 9.3.2.14.1 and 9.3.2.14.2 is applicable to the vessel.

9.3.2.15 *Stability (damaged condition)*

9.3.2.15.1 The following assumptions shall be taken into consideration for the damaged condition:

- (a) The extent of side damage is as follows:
- | | |
|----------------------|--|
| longitudinal extent: | at least 0.10 L, but not less than 5.00 m; |
| transverse extent: | 0.79 m; |
| vertical extent: | from the base line upwards without limit. |
- (b) The extent of bottom damage is as follows:
- | | |
|----------------------|--|
| longitudinal extent: | at least 0.10 L, but not less than 5.00 m; |
| transverse extent: | 3.00 m; |
| vertical extent: | from the base 0.59 m upwards, the sump excepted. |
- (c) Any bulkheads within the damaged area shall be assumed damaged, which means that the location of bulkheads shall be chosen so as to ensure that the vessel remains afloat after the flooding of two or more adjacent compartments in the longitudinal direction.

The following provisions are applicable:

- For bottom damage, adjacent athwartship compartments shall also be assumed as flooded;
- The lower edge of any non-watertight openings (e.g. doors, windows, access hatchways) shall, at the final stage of flooding, be not less than 0.10 m above the damage waterline;
- In general, permeability shall be assumed to be 95%. Where an average permeability of less than 95% is calculated for any compartment, this calculated value obtained may be used.

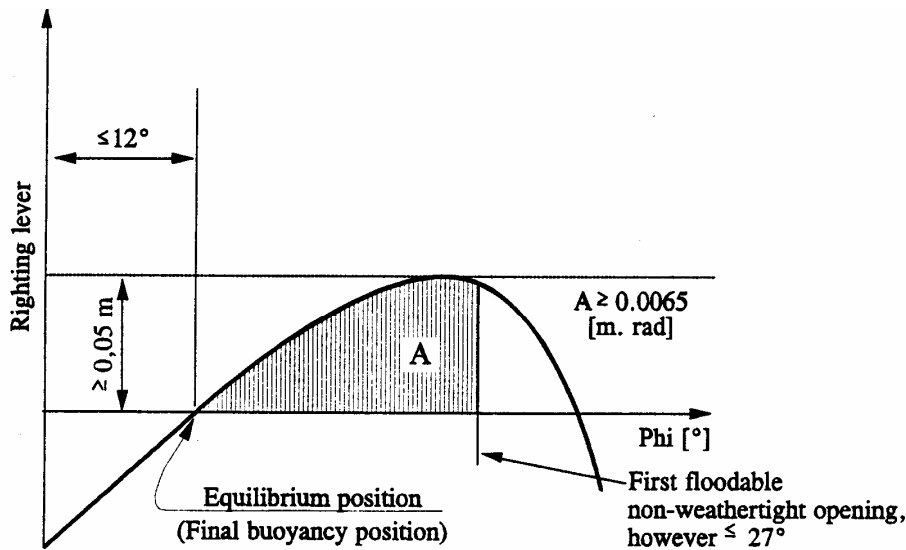
However, the following minimum values shall be used:

- | | |
|--|------------|
| – engine rooms: | 85%; |
| – accommodation: | 95%; |
| – double bottoms, oil fuel tanks, ballast tanks, etc., depending on whether, according to their function, they have to be assumed as full or empty for the vessel floating at the maximum permissible draught: | 0% or 95%. |

For the main engine room only the one-compartment standard need be taken into account, i.e. the end bulkheads of the engine room shall be assumed as not damaged.

- 9.3.2.15.2 At the stage of equilibrium (final stage of flooding), the angle of heel shall not exceed 12°. Non-watertight openings shall not be flooded before reaching the stage of equilibrium. If such openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purpose of the stability calculation.

The positive range of the righting lever curve beyond the stage of equilibrium shall have a righting lever of ≥ 0.05 m in association with an area under the curve of ≥ 0.0065 m.rad. The minimum values of stability shall be satisfied up to immersion of the first non-watertight opening and in any event up to an angle of heel $\leq 27^\circ$. If non-watertight openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purposes of stability calculation.



9.3.2.15.3 If openings through which undamaged compartments may additionally become flooded are capable of being closed watertight, the closing appliances shall be marked accordingly.

9.3.2.15.4 Where cross- or down-flooding openings are provided for reduction of unsymmetrical flooding, the time for equalisation shall not exceed 15 minutes, if during the intermediate stages of flooding sufficient stability has been proved.

9.3.2.16 *Engine rooms*

9.3.2.16.1 Internal combustion engines for the vessel's propulsion as well as internal combustion engines for auxiliary machinery shall be located outside the cargo area. Entrances and other openings of engine rooms shall be at a distance of not less than 2.00 m from the cargo area.

9.3.2.16.2 The engine rooms shall be accessible from the deck; the entrances shall not face the cargo area. Where the doors are not located in a recess whose depth is at least equal to the door width, the hinges shall face the cargo area.

9.3.2.17 *Accommodation and service spaces*

9.3.2.17.1 Accommodation spaces and the wheelhouse shall be located outside the cargo area forward of the fore vertical plane or abaft the aft vertical plane bounding the part of cargo area below deck. Windows of the wheelhouse which are located not less than 1.00 m above the bottom of the wheelhouse may tilt forward.

9.3.2.17.2 Entrances to spaces and openings of superstructures shall not face the cargo area. Doors opening outward and not located in a recess the depth of which is at least equal to the width of the doors shall have their hinges face the cargo area.

9.3.2.17.3 Entrances from the deck and openings of spaces facing the weather shall be capable of being closed. The following instruction shall be displayed at the entrance of such spaces:

**Do not open during loading and unloading without
the permission of the master.
Close immediately.**

- 9.3.2.17.4 Entrances and windows of superstructures and accommodation spaces which can be opened as well as other openings of these spaces shall be located not less than 2.00 m from the cargo area. No wheelhouse doors and windows shall be located within 2.00 m from the cargo area, except where there is no direct connection between the wheelhouse and the accommodation.
- 9.3.2.17.5
- (a) Driving shafts of the bilge or ballast pumps in the cargo area may penetrate through the bulkhead between the service space and the engine room, provided the arrangement of the service space is in compliance with 9.3.2.11.6.
 - (b) The penetration of the shaft through the bulkhead shall be gastight and shall have been approved by a recognised classification society.
 - (c) The necessary operating instructions shall be displayed.
 - (d) Penetrations through the bulkhead between the engine room and the service space in the cargo area and the bulkhead between the engine room and the hold spaces may be provided for electrical cables, hydraulic and piping for measuring, control and alarm systems, provided that the penetration have been approved by a recognised classification society. The penetrations shall be gastight. Penetrations through a bulkhead with an “A-60” fire protection insulation according to SOLAS 74, Chapter II-2, Regulation 3, shall have an equivalent fire protection.
 - (e) Pipes may penetrate the bulkhead between the engine room and the service space in the cargo area provided that these are pipes between the mechanical equipment in the engine room and the service space which do not have any openings within the service space and which are provided with shut-off devices at the bulkhead in the engine room.
 - (f) Notwithstanding 9.3.2.11.4, pipes from the engine room may pass through the service space in the cargo area or a cofferdam or a hold space or a double-hull space to the outside provided that within the service space or cofferdam or hold space or double-hull space they are of the thick-walled type and have no flanges or openings.
 - (g) Where a driving shaft of auxiliary machinery penetrates through a wall located above the deck the penetration shall be gastight.
- 9.3.2.17.6 A service space located within the cargo area below deck shall not be used as a cargo pump-room for the loading and unloading system, except where:
- the pump room is separated from the engine room or from service spaces outside the cargo area by a cofferdam or a bulkhead with an “A-60” fire protection insulation according to SOLAS 74, Chapter II-2, Regulation 3, or by a service space or a hold space;
 - the “A-60” bulkhead required above does not include penetrations referred to in 9.3.2.17.5 (a);
 - ventilation exhaust outlets are located not less than 6.00 m from entrances and openings of the accommodation and service spaces outside the cargo area;
 - the access hatches and ventilation inlets can be closed from the outside;
 - all pipes for loading and unloading as well as those of stripping systems are provided with shut-off devices at the pump suction side in the cargo pump-room immediately at the bulkhead. The necessary operation of the control devices in the pump-room,

starting of pumps and necessary control of the liquid flow rate shall be effected from the deck;

- the bilge of the cargo pump-room is equipped with a gauging device for measuring the filling level which activates a visual and audible alarm in the wheelhouse when liquid is accumulating in the cargo pump-room bilge;
- the cargo pump-room is provided with a permanent gas-detection system which automatically indicates the presence of explosive gases or lack of oxygen by means of direct-measuring sensors and which actuates a visual and audible alarm when the gas concentration has reached 20% of the lower explosive limit. The sensors of this system shall be placed at suitable positions at the bottom and directly below the deck.

Measurement shall be continuous.

The audible and visual alarms are installed in the wheelhouse and in the cargo pump-room and, when the alarm is actuated, the loading and unloading system is shut down. Failure of the gas detection system shall be immediately signalled in the wheelhouse and on deck by means of audible and visual alarms;

- the ventilation system prescribed in 9.3.9.12.3 has a capacity of not less than 30 changes of air per hour based on the total volume of the service space.

9.3.2.17.7 The following instruction shall be displayed at the entrance of the cargo pump-room:

**Before entering the cargo pump-room check whether
it is free from gases and contains sufficient oxygen.
Do not open doors and entrance openings without
the permission of the master.
Leave immediately in the event of alarm.**

9.3.2.18 *Inerting facility*

In cases in which inerting or blanketing of the cargo is prescribed, the vessel shall be equipped with an inerting system.

This system shall be capable of maintaining a permanent minimum pressure of 7 kPa (0.07 bar) in the spaces to be inerted. In addition, the inerting system shall not increase the pressure in the cargo tank to a pressure greater than that at which the pressure valve is regulated. The set pressure of the vacuum-relief valve shall be 3.5 kPa (0.035 bar).

A sufficient quantity of inert gas for loading or unloading shall be carried or produced on board if it is not possible to obtain it on shore. In addition, a sufficient quantity of inert gas to offset normal losses occurring during carriage shall be on board.

The premises to be inerted shall be equipped with connections for introducing the inert gas and monitoring systems so as to ensure the correct atmosphere on a permanent basis.

When the pressure or the concentration of inert gas in the gaseous phase falls below a given value, this monitoring system shall activate an audible and visible alarm in the wheelhouse. When the wheelhouse is unoccupied, the alarm shall also be perceptible in a location occupied by a crew member.

9.3.2.19 (*Reserved*)

9.3.2.20 *Arrangement of cofferdams*

- 9.3.2.20.1 Cofferdams or cofferdam compartments remaining once a service space has been arranged in accordance with 9.3.2.11.6 shall be accessible through an access hatch. If, however, the cofferdam is connected to a double-hull space, it is sufficient for it to be accessible from that space. In this case an arrangement shall be made for possible monitoring in order to ascertain from the deck whether the cofferdam is empty.
- 9.3.2.20.2 Cofferdams shall be capable of being filled with water and emptied by means of a pump. Filling shall be effected within 30 minutes. These requirements are not applicable when the bulkhead between the engine room and the cofferdam comprises fire-protection insulation "A-60" in accordance with SOLAS 74, Chapter II-2, Regulation 3, or has been fitted out as a service space. The cofferdams shall not be fitted with inlet valves.
- 9.3.2.20.3 No fixed pipe shall permit connection between a cofferdam and other piping of the vessel outside the cargo area.
- 9.3.2.20.4 The ventilation openings of cofferdams shall be fitted with a flame-arrester withstanding a deflagration.

9.3.2.21 *Safety and control installations*

- 9.3.2.21.1 Cargo tanks shall be provided with the following equipment:
- (a) a mark inside the tank indicating the liquid level of 95%;
 - (b) a level gauge;
 - (c) a level alarm device which is activated at the latest when a degree of filling of 90% is reached;
 - (d) a high level sensor for actuating the facility against overflowing at the latest when a degree of filling of 97.5% is reached;
 - (e) an instrument for measuring the pressure of the vapour phase inside the cargo tank;
 - (f) an instrument for measuring the temperature of the cargo, if in column (9) of Table C of Chapter 3.2 a heating installation is required, or if a maximum temperature is indicated in column (20) of that list;
 - (g) a connection for a sampling device, closed or partially closed, and/or at least one sampling opening as required in column (13) of Table C of Chapter 3.2.
- 9.3.2.21.2 When the degree of filling in per cent is determined, an error of not more than 0.5% is permitted. It shall be calculated on the basis of the total cargo tank capacity including the expansion trunk.
- 9.3.2.21.3 The level gauge shall allow readings from the control position of the shut-off devices of the particular cargo tank. The permissible maximum filling level of the cargo tank shall be marked on each level gauge.

Permanent reading of the overpressure and vacuum shall be possible from a location from which loading or unloading operations may be interrupted. The permissible maximum overpressure and vacuum shall be marked on each level gauge.

Readings shall be possible in all weather conditions.

9.3.2.21.4 The level alarm device shall give a visual and audible warning on board when actuated. The level alarm device shall be independent of the level gauge.

9.3.2.21.5 (a) The high level sensor referred to in 9.3.2.21.1 (d) above shall give a visual and audible alarm on board and at the same time actuate an electrical contact which in the form of a binary signal interrupts the electric current loop provided and fed by the shore facility, thus initiating measures at the shore facility against overflowing during loading operations.

The signal shall be transmitted to the shore facility via a watertight two-pin plug of a connector device in accordance with standard EN 60309-2:1999 for direct current of 40 to 50 volts, identification colour white, position of the nose 10 h.

The plug shall be permanently fitted to the vessel close to the shore connections of the loading and unloading pipes.

The high level sensor shall also be capable of switching off the vessel's own discharging pump. The high level sensor shall be independent of the level alarm device, but it may be connected to the level gauge.

(b) During discharging by means of the on-board pump, it shall be possible for the shore facility to switch it off. For this purpose, an independent intrinsically safe power line, fed by the vessel, shall be switched off by the shore facility by means of an electrical contact.

It shall be possible for the binary signal of the shore facility to be transmitted via a watertight two-pole socket or a connector device in accordance with standard EN 60309-2:1999, for direct current of 40 to 50 volts, identification colour white, position of the nose 10 h.

This socket shall be permanently fitted to the vessel close to the shore connections of the unloading pipes.

(c) Vessels which may be delivering products required for operation of vessels shall be equipped with a transshipment facility compatible with European standard EN 12 827:1996 and a rapid closing device enabling refuelling to be interrupted. It shall be possible to actuate this rapid closing device by means of an electrical signal from the overflow prevention system. The electrical circuits actuating the rapid closing device shall be secured according to the quiescent current principle or other appropriate error detection measures. The state of operation of electrical circuits which cannot be controlled using the quiescent current principle shall be capable of being easily checked.

It shall be possible to actuate the rapid closing device independently of the electrical signal.

The rapid closing device shall actuate a visual and audible alarm on board.

9.3.2.21.6 The visual and audible signals given by the level alarm device shall be clearly distinguishable from those of the high level sensor.

The visual alarm shall be visible at each control position on deck of the cargo tank stop valves. It shall be possible to easily check the functioning of the sensors and electric circuits or these shall be "intrinsically safe apparatus".

- 9.3.2.21.7 When the pressure or temperature exceeds a set value, instruments for measuring the vacuum or overpressure of the gaseous phase in the cargo tank or the temperature of the cargo, shall activate a visual and audible alarm in the wheelhouse. When the wheelhouse is unoccupied the alarm shall also be perceptible in a location occupied by a crew member.

When the pressure exceeds the set value during loading, the instrument for measuring the pressure shall, by means of the plug referred to in 9.3.2.21.5 above, initiate immediately an electrical contact which shall put into effect measures to interrupt the loading operation. If the vessel's own discharge pump is used, it shall be switched off automatically.

The instrument for measuring the overpressure or vacuum shall activate the alarm at latest when an overpressure equal to 1.15 times the opening pressure of the pressure relief device, or a vacuum pressure equal to the construction vacuum pressure but not exceeding 5 kPa (0.05 bar). The maximum allowable temperature is indicated in column (20) of Table C of Chapter 3.2. The sensors for the alarms mentioned in this paragraph may be connected to the alarm device of the sensor.

When it is prescribed in column (20) of Table C of Chapter 3.2, the instrument for measuring the overpressure of the gaseous phase shall activate a visible and audible alarm in the wheelhouse when the overpressure exceeds 40 kPa (0.4 bar) during the voyage. When the wheelhouse is unoccupied, the alarm shall also be perceptible in a location occupied by a crew member.

- 9.3.2.21.8 Where the control elements of the shut-off devices of the cargo tanks are located in a control room, it shall be possible to stop the loading pumps and read the level gauges in the control room, and the visual and audible warning given by the level alarm device, the high level sensor referred to in 9.3.2.21.1 (d) and the instruments for measuring the pressure and temperature of the cargo shall be noticeable in the control room and on deck.

Satisfactory monitoring of the cargo area shall be ensured from the control room.

- 9.3.2.21.9 The vessel shall be so equipped that loading or unloading operations can be interrupted by means of switches, i.e. the quick-action stop valve located on the flexible vessel-to-shore connecting line must be capable of being closed. The switch shall be placed at two points on the vessel (fore and aft).

This provision applies only when prescribed in column (20) of Table C of Chapter 3.2.

The interruption system shall be designed according to the quiescent current principle.

9.3.2.22 *Cargo tank openings*

- 9.3.2.22.1 (a) Cargo tank openings shall be located on deck in the cargo area.
- (b) Cargo tank openings with a cross-section of more than 0.10 m² and openings of safety devices for preventing overpressures shall be located not less than 0.50 m above deck.
- 9.3.2.22.2 Cargo tank openings shall be fitted with gastight closures capable of withstanding the test pressure in accordance with 9.3.2.23.2
- 9.3.2.22.3 Closures which are normally used during loading or unloading operations shall not cause sparking when operated.
- 9.3.2.22.4 (a) Each cargo tank or group of cargo tanks connected to a common vapour pipe shall be fitted with:

- safety devices for preventing unacceptable overpressures or vacuums. When anti-explosion protection is required in column (17) of Table C of Chapter 3.2, the vacuum valve shall be fitted with a flame arrester capable of withstanding a deflagration and the pressure-relief valve with a high-velocity vent valve capable of withstanding steady burning.

The gases shall be discharged upwards. The opening pressure of the high-velocity vent valve and the opening pressure of the vacuum valve shall be indelibly indicated on the valves;

- a connection for the safe return ashore of gases expelled during loading;
- a device for the safe depressurisation of the tanks consisting of at least a fire-resistant flame-arrester and a stop valve which clearly indicates whether it is open or shut.

- (b) The outlets of high-velocity vent valves shall be located not less than 2.00 m above the deck and at a distance of not less than 6.00 m from the accommodation and from the service spaces outside the cargo area. This height may be reduced when within a radius of 1.00 m round the outlet of the high-velocity vent valve, there is no equipment, no work is being carried out and signs indicate the area. The setting of the high-velocity vent valves shall be such that during the transport operation they do not blow off until the maximum permissible working pressure of the cargo tanks is reached.

9.3.2.22.5 (a) Insofar as anti-explosion protection is prescribed in column (17) of Table C of Chapter 3.2, a vapour pipe connecting two or more cargo tanks shall be fitted, at the connection to each cargo tank, with a flame arrester with a fixed or spring-loaded plate stack, capable of withstanding a detonation. This equipment may consist of:

- (i) a flame arrester fitted with a fixed plate stack, where each cargo tank is fitted with a vacuum valve capable of withstanding a deflagration and a high-velocity vent valve capable of withstanding steady burning;
- (ii) a flame arrester fitted with a spring-loaded plate stack, where each cargo tank is fitted with a vacuum valve capable of withstanding a deflagration;
- (iii) a flame arrester with a fixed plate stack;
- (iv) a flame arrester with a fixed plate stack, where the pressure-measuring device is fitted with an alarm system in accordance with 9.3.2.21.7;
- (v) a flame arrester with a spring-loaded plate stack, where the pressure-measuring device is fitted with an alarm system in accordance with 9.3.2.21.7.

When a fire-fighting installation is permanently mounted on deck in the cargo area and can be brought into service from the deck and from the wheelhouse, flame arresters need not be required for individual cargo tanks.

Only substances which do not mix and which do not react dangerously with each other may be carried simultaneously in cargo tanks connected to a common vapour pipe;

or

- (b) Insofar as anti-explosion protection is prescribed in column (17) of Table C of Chapter 3.2, a vapour pipe connecting two or more cargo tanks shall be fitted, at the

connection to each cargo tank, with a pressure/vacuum relief valve incorporating a flame arrester capable of withstanding a detonation/deflagration.

Only substances which do not mix and which do not react dangerously with each other may be carried simultaneously in cargo tanks connected to a common vapour pipe;

or

- (c) Insofar as anti-explosion protection is prescribed in column (17) of Table C of Chapter 3.2, an independent vapour pipe for each cargo tank, fitted with a vacuum valve incorporating a flame arrester capable of withstanding a deflagration and a high velocity vent valve incorporating a flame arrester capable of withstanding steady burning. Several different substances may be carried simultaneously;

or

- (d) Insofar as anti-explosion protection is prescribed in column (17) of Table C of Chapter 3.2, a vapour pipe connecting two or more cargo tanks shall be fitted, at the connection to each cargo tank, with a shut-off device capable of withstanding a detonation, where each cargo tank is fitted with a vacuum valve capable of withstanding a deflagration and a high-velocity vent valve capable of withstanding steady burning.

Only substances which do not mix and which do not react dangerously with each other may be carried simultaneously in cargo tanks connected to a common vapour pipe.

9.3.2.23 *Pressure tests*

- 9.3.2.23.1 The cargo tanks, residual cargo tanks, cofferdams, pipes for loading and unloading shall be subjected to initial tests before being put into service and thereafter at prescribed intervals.

Where a heating system is provided inside the cargo tanks, the heating coils shall be subjected to initial tests before being put into service and thereafter at prescribed intervals.

- 9.3.2.23.2 The test pressure for the cargo tanks and residual cargo tanks shall be not less than 1.3 times the construction pressure. The test pressure for the cofferdams and open cargo tanks shall be not less than 10 kPa (0.10 bar) gauge pressure.

- 9.3.2.23.3 The test pressure for pipes for loading and unloading shall be not less than 1,000 kPa (10 bar) gauge pressure.

- 9.3.2.23.4 The maximum intervals for the periodic tests shall be 11 years.

- 9.3.2.23.5 The procedure for pressure tests shall comply with the provisions established by the competent authority or a recognised classification society.

- 9.3.2.24 (*Reserved*)

9.3.2.25 *Pumps and piping*

- 9.3.2.25.1 Pumps, compressors and accessory loading and unloading piping shall be placed in the cargo area. Cargo pumps shall be capable of being shut down from the cargo area and, in addition, from a position outside the cargo area. Cargo pumps situated on deck shall be located not less than 6.00 m from entrances to, or openings of, the accommodation and service spaces outside the cargo area.

- 9.3.2.25.2
- (a) Pipes for loading and unloading shall be independent of any other piping of the vessel. No cargo piping shall be located below deck, except those inside the cargo tanks and inside the cargo pump-room.
 - (b) The pipes for loading and unloading shall be arranged so that, after loading or unloading operations, the liquid remaining in these pipes may be safely removed and may flow either into the vessel's tanks or the tanks ashore.
 - (c) Pipes for loading and unloading shall be clearly distinguishable from other piping, e.g. by means of colour marking.
 - (d) The pipes for loading and unloading located on deck, with the exception of the shore connections, shall be located not less than a quarter of the vessel's breadth from the outer shell.
 - (e) The shore connections shall be located not less than 6.00 m from the entrances to, or openings of, the accommodation and service spaces outside the cargo area.
 - (f) Each shore connection of the vapour pipe and shore connections of the pipes for loading and unloading, through which the loading or unloading operation is carried out, shall be fitted with a shut-off device. However, each shore connection shall be fitted with a blind flange when it is not in operation.

Each shore connection of the pipes for loading and unloading through which the loading or unloading operation is carried out shall be fitted with the device intended for the discharge of residual cargo described in 8.6.4.1.

- (g) The vessel shall be equipped with an additional stripping system.
- (h) The flanges and stuffing boxes shall be provided with a spray protection device.
- (i) Pipes for loading and unloading, and vapour pipes, shall not have flexible connections fitted with sliding seals.

- 9.3.2.25.3
- The distance referred to in 9.3.2.25.1 and 9.3.2.25.2 (e) may be reduced to 3.00 m if a transverse bulkhead complying with 9.3.2.10.2 is situated at the end of the cargo area. The openings shall be provided with doors.

The following notice shall be displayed on the doors:

**Do not open during loading and unloading without
the permission of the master.
Close immediately.**

- 9.3.2.25.4
- (a) Every component of the pipes for loading and unloading shall be electrically connected to the hull.
 - (b) The pipes for loading shall extend down to the bottom of the cargo tanks.
- 9.3.2.25.5
- The stop valves or other shut-off devices of the pipes for loading and unloading shall indicate whether they are open or shut.
- 9.3.2.25.6
- The pipes for loading and unloading shall have, at the test pressure, the required elasticity, leakproofness and resistance to pressure.

9.3.2.25.7 The pipes for loading and unloading shall be fitted with pressure gauges at the outlet of the pumps. The permissible maximum overpressure or vacuum value shall be indicated on each installation. Readings shall be possible in all weather conditions.

9.3.2.25.8 (a) When pipes for loading and unloading are used for supplying the cargo tanks with washing or ballast water, the suctions of these pipes shall be located within the cargo area but outside the cargo tanks.

Pumps for tank washing systems with associated connections may be located outside the cargo area, provided the discharge side of the system is arranged in such a way that the suction is not possible through that part.

A spring-loaded non-return valve shall be provided to prevent any gases from being expelled from the cargo area through the tank washing system.

(b) A non-return valve shall be fitted at the junction between the water suction pipe and the cargo loading pipe.

9.3.2.25.9 The permissible loading and unloading flows shall be calculated.

Calculations concern the permissible maximum loading and unloading flow for each cargo tank or each group of cargo tanks, taking into account the design of the ventilation system. These calculations shall take into consideration the fact that in the event of an unforeseen cut-off of the gas return piping or the compensation piping of the shore facility, the safety devices of the cargo tanks will prevent pressure in the cargo tanks from exceeding the following values:

over-pressure: 115% of the opening pressure of the high-velocity vent valve;

vacuum pressure: not more than the construction vacuum pressure but not exceeding 5 kPa (0.05 bar).

The main factors to be considered are the following:

1. Dimensions of the ventilation system of the cargo tanks;
2. Gas formation during loading: multiply the largest loading flow by a factor of not less than 1.25;
3. Density of the vapour mixture of the cargo based on 50% volume vapour and 50% volume air;
4. Loss of pressure through ventilation pipes, valves and fittings. Account will be taken of a 30% clogging of the mesh of the flame-arrester;
5. Chocking pressure of the safety valves.

The permissible maximum loading and unloading pressure for each cargo tank or for each group of cargo tanks shall be given in an on-board instruction.

9.3.2.25.10 The stripping system shall be subjected to initial tests before being put into service or thereafter if any alteration has been made to it, using water as test medium. The test and the determination of the residual quantities shall be carried out in accordance with the requirements of 8.6.4.2.

In this test, the following residual quantities shall not be exceeded:

- (a) 5 l for each cargo tank;
- (b) 15 l for each pipe system.

The residual quantities obtained in the test shall be entered in the certificate for the test of the stripping system referred to in 8.6.4.3.

NOTE: It is not necessary to apply this paragraph. The date of application will be defined later.

- 9.3.2.25.11 If the vessel is carrying several dangerous substances liable to react dangerously with each other, a separate pump with its own piping for loading and unloading shall be installed for each substance. The piping shall not pass through a cargo tank containing dangerous substances with which the substance in question is liable to react.

9.3.2.26 Residual cargo tanks and slop tanks

- 9.3.2.26.1 The vessel shall be provided with at least one residual cargo tank and with slop tanks for slops which are not suitable for pumping. These tanks shall be located only in the cargo area. Intermediate bulk containers or tank-containers or portable tanks in accordance with 7.2.4.1 may be used instead of a fixed residual cargo tank. During filling of these intermediate bulk containers or tank-containers or portable tanks, means for collecting any leakage shall be placed under the filling connections.

- 9.3.2.26.2 Slop tanks shall be fire resistant and shall be capable of being closed with lids (e.g. drums with lever closing ring lids). The tanks shall be marked and easy to handle.

- 9.3.2.26.3 The maximum capacity of a residual cargo tank is 30 m³.

- 9.3.2.26.4 The residual cargo tank shall be equipped with:

- pressure-relief and a vacuum relief valves.

The high velocity vent valve shall be so regulated as not to open during carriage. This condition is met when the opening pressure of the valve meets the conditions set out in column (10) of Table C of Chapter 3.2;

When anti-explosion protection is required in column (17) of Table C of Chapter 3.2, the vacuum-relief valve shall be capable of withstanding deflagrations and the high-velocity vent valve shall withstand steady burning;

- a level indicator;
- connections with shut-off devices, for pipes and hoses.

Intermediate bulk containers (IBCs), tank containers and portable tanks intended to collect cargo remains, cargo residues or slops shall be equipped with:

- a connection enabling gases released during filling to be evacuated safely;
- a possibility of indicating the degree of filling;
- connections with shut-off devices, for pipes and hoses.

Residual cargo tanks, intermediate bulk containers (IBCs), tank containers and portable tanks shall be connected to the vapour pipe of cargo tanks only for the time necessary to fill them in accordance with 7.2.4.15.2.

Residual cargo tanks, intermediate bulk containers (IBCs), tank-containers and portable tanks placed on the deck shall be located at a minimum distance from the hull equal to one quarter of the vessel's breadth.

9.3.2.27 (Reserved)

9.3.2.28 *Water-spray system*

When water-spraying is required in column (9) of Table C of Chapter 3.2, a water-spray system shall be installed in the cargo area on deck to enable gas emissions from loading to be precipitated and to cool the tops of cargo tanks by spraying water over the whole surface so as to avoid safely the activation of the high-velocity vent valve at 50 kPa (0.5 bar).

The gas precipitation system shall be fitted with a connection device for supply from a shore installation.

The spray nozzles shall be so installed that the entire cargo deck area is covered and the gases released are precipitated safely.

The system shall be capable of being put into operation from the wheelhouse and from the deck. Its capacity shall be such that when all the spray nozzles are in operation, the outflow is not less than 50 litres per square metre of deck area and per hour.

9.3.2.29-
9.3.2.30 (Reserved)

9.3.2.31 *Engines*

9.3.2.31.1 Only internal combustion engines running on fuel with a flashpoint of more than 55° C are allowed.

9.3.2.31.2 Ventilation inlets of the engine room, and when the engines do not take in air directly from the engine room, air intakes of the engines shall be located not less than 2.00 m from the cargo area.

9.3.2.31.3 Sparking shall not be possible within the cargo area.

9.3.2.31.4 The surface temperature of the outer parts of engines used during loading or unloading operations, as well as that of their air inlets and exhaust ducts shall not exceed the allowable temperature according to the temperature class of the substances carried. This provision does not apply to engines installed in service spaces provided the provisions of 9.3.2.52.3 are fully complied with.

9.3.2.31.5 The ventilation in the closed engine room shall be designed so that, at an ambient temperature of 20 °C, the average temperature in the engine room does not exceed 40° C.

9.3.2.32 *Oil fuel tanks*

9.3.2.32.1 Where the vessel is provided with hold spaces, the double bottoms within these spaces may be arranged as oil fuel tanks, provided their depth is not less than 0.6 m.

Oil fuel pipes and openings of such tanks are not permitted in the hold space.

9.3.2.32.2 The open ends of the air pipes of all oil fuel tanks shall extend to not less than 0.5 m above the open deck. Their open ends and the open ends of overflow pipes leading to the deck shall be fitted with a protective device consisting of a gauze diaphragm or a perforated plate.

9.3.2.33 (*Reserved*)

9.3.2.34 *Exhaust pipes*

9.3.2.34.1 Exhausts shall be evacuated from the vessel into the open air either upwards through an exhaust pipe or through the shell plating. The exhaust outlet shall be located not less than 2.00 m from the cargo area. The exhaust pipes of engines shall be arranged so that the exhausts are led away from the vessel. The exhaust pipes shall not be located within the cargo area.

9.3.2.34.2 Exhaust pipes shall be provided with a device preventing the escape of sparks, e.g. spark arresters.

9.3.2.35 *Bilge pumping and ballasting arrangements*

9.3.2.35.1 Bilge and ballast pumps for spaces within the cargo area shall be installed within such area.

This provision does not apply to:

- double-hull spaces and double bottoms which do not have a common boundary wall with the cargo tanks;
- cofferdams, hold spaces and double bottoms where ballasting is carried out using the piping of the fire-fighting system in the cargo area and bilge-pumping is performed using educators.

9.3.2.35.2 Where the double bottom is used as a liquid oil fuel tank, it shall not be connected to the bilge piping system.

9.3.2.35.3 Where the ballast pump is installed in the cargo area, the standpipe and its outboard connection for suction of ballast water shall be located within the cargo area but outside the cargo tanks.

9.3.2.35.4 A cargo pump-room below deck shall be capable of being drained in an emergency by an installation located in the cargo area and independent from any other installation. This installation shall be provided outside the cargo pump-room.

9.3.2.36-
9.3.2.39 (*Reserved*)

9.3.2.40 *Fire-extinguishing arrangements*

9.3.2.40.1 A fire-extinguishing system shall be installed on the vessel. This system shall comply with the following requirements:

- It shall be supplied by two independent fire or ballast pumps, one of which shall be ready for use at any time. These pumps and their means of propulsion and electrical equipment shall not be installed in the same space.;
- It shall be provided with a water main fitted with at least three hydrants in the cargo area above deck. Three suitable and sufficiently long hoses with spray nozzles having

a diameter of not less than 12 mm shall be provided. It shall be possible to reach any point of the deck in the cargo area simultaneously with at least two jets of water which do not emanate from the same hydrant.

A spring-loaded non-return valve shall be fitted to ensure that no gases can escape through the fire-extinguishing system into the accommodation or service spaces outside the cargo area;

- The capacity of the system shall be at least sufficient for a jet of water to have a minimum reach of not less than the vessel's breadth from any location on board with two spray nozzles being used at the same time.

9.3.2.40.2 In addition, the engine rooms, the pump-room and all spaces containing essential equipment (switchboards, compressors, etc.) for the refrigeration equipment, if any, shall be provided with a permanently fixed fire-extinguishing system meeting the following requirements:

9.3.2.40.2.1 *Extinguishing agents*

For the protection of spaces in engine rooms, boiler rooms and pump rooms, only permanently fixed fire-extinguishing systems using the following extinguishing agents are permitted:

- (a) CO₂ (carbon dioxide);
- (b) HFC 227 ea (heptafluoropropane);
- (c) IG-541 (52% nitrogen, 40% argon, 8% carbon dioxide).
- (d) FK-5-1-12 (dodecafluoro 2-methylpentane-3-one).

Other extinguishing agents are permitted only on the basis of recommendations by the Administrative Committee.

9.3.2.40.2.2 *Ventilation, air extraction*

- (a) The combustion air required by the combustion engines which ensure propulsion should not come from spaces protected by permanently fixed fire-extinguishing systems. This requirement is not mandatory if the vessel has two independent main engine rooms with a gastight separation or if, in addition to the main engine room, there is a separate engine room installed with a bow thruster that can independently ensure propulsion in the event of a fire in the main engine room.
- (b) All forced ventilation systems in the space to be protected shall be shut down automatically as soon as the fire-extinguishing system is activated.
- (c) All openings in the space to be protected which permit air to enter or gas to escape shall be fitted with devices enabling them to be closed rapidly. It shall be clear whether they are open or closed.
- (d) Air escaping from the pressure-relief valves of the pressurised air tanks installed in the engine rooms shall be evacuated to the open air.
- (e) Overpressure or negative pressure caused by the diffusion of the extinguishing agent shall not destroy the constituent elements of the space to be protected. It shall be possible to ensure the safe equalisation of pressure.

- (f) Protected spaces shall be provided with a means of extracting the extinguishing agent. If extraction devices are installed, it shall not be possible to start them up during extinguishing.

9.3.2.40.2.3 *Fire alarm system*

The space to be protected shall be monitored by an appropriate fire alarm system. The alarm signal shall be audible in the wheelhouse, the accommodation and the space to be protected.

9.3.2.40.2.4 *Piping system*

- (a) The extinguishing agent shall be routed to and distributed in the space to be protected by means of a permanent piping system. Piping installed in the space to be protected and the reinforcements it incorporates shall be made of steel. This shall not apply to the connecting nozzles of tanks and compensators provided that the materials used have equivalent fire-retardant properties. Piping shall be protected against corrosion both internally and externally.
- (b) The discharge nozzles shall be so arranged as to ensure the regular diffusion of the extinguishing agent. In particular, the extinguishing agent must also be effective beneath the floor.

9.3.2.40.2.5 *Triggering device*

- (a) Automatically activated fire-extinguishing systems are not permitted.
- (b) It shall be possible to activate the fire-extinguishing system from a suitable point located outside the space to be protected.
- (c) Triggering devices shall be so installed that they can be activated in the event of a fire and so that the risk of their breakdown in the event of a fire or an explosion in the space to be protected is reduced as far as possible.

Systems which are not mechanically activated shall be supplied from two energy sources independent of each other. These energy sources shall be located outside the space to be protected. The control lines located in the space to be protected shall be so designed as to remain capable of operating in the event of a fire for a minimum of 30 minutes. The electrical installations are deemed to meet this requirement if they conform to the IEC 60331-21:1999 standard.

When the triggering devices are so placed as not to be visible, the component concealing them shall carry the "Fire-fighting system" symbol, each side being not less than 10 cm in length, with the following text in red letters on a white ground:

Fire-extinguishing system

- (d) If the fire-extinguishing system is intended to protect several spaces, it shall comprise a separate and clearly-marked triggering device for each space.
- (e) The instructions shall be posted alongside all triggering devices and shall be clearly visible and indelible. The instructions shall be in a language the master can read and understand and if this language is not English, French or German, they shall be in English, French or German. They shall include information concerning:
 - (i) the activation of the fire-extinguishing system;

- (ii) the need to ensure that all persons have left the space to be protected;
 - (iii) The correct behaviour of the crew in the event of activation and when accessing the space to be protected following activation or diffusion, in particular in respect of the possible presence of toxic substances;
 - (iv) the correct behaviour of the crew in the event of the failure of the fire-extinguishing system to function properly.
- (f) The instructions shall mention that prior to the activation of the fire-extinguishing system, combustion engines installed in the space and aspirating air from the space to be protected, shall be shut down.

9.3.2.40.2.6 *Alarm device*

- (a) Permanently fixed fire-extinguishing systems shall be fitted with an audible and visual alarm device.
- (b) The alarm device shall be set off automatically as soon as the fire-extinguishing system is first activated. The alarm device shall function for an appropriate period of time before the extinguishing agent is released; it shall not be possible to turn it off.
- (c) Alarm signals shall be clearly visible in the spaces to be protected and their access points and be clearly audible under operating conditions corresponding to the highest possible sound level. It shall be possible to distinguish them clearly from all other sound and visual signals in the space to be protected.
- (d) Sound alarms shall also be clearly audible in adjoining spaces, with the communicating doors shut, and under operating conditions corresponding to the highest possible sound level.
- (e) If the alarm device is not intrinsically protected against short circuits, broken wires and drops in voltage, it shall be possible to monitor its operation.
- (f) A sign with the following text in red letters on a white ground shall be clearly posted at the entrance to any space the extinguishing agent may reach:

Warning, fire-extinguishing system!
Leave this space immediately when the ... (description) alarm is activated!

9.3.2.40.2.7 *Pressurised tanks, fittings and piping*

- (a) Pressurised tanks, fittings and piping shall conform to the requirements of the competent authority.
- (b) Pressurised tanks shall be installed in accordance with the manufacturer's instructions.
- (c) Pressurised tanks, fittings and piping shall not be installed in the accommodation.
- (d) The temperature of cabinets and storage spaces for pressurised tanks shall not exceed 50 °C.
- (e) Cabinets or storage spaces on deck shall be securely stowed and shall have vents so placed that in the event of a pressurised tank not being gastight, the escaping gas

cannot penetrate into the vessel. Direct connections with other spaces are not permitted.

9.3.2.40.2.8 *Quantity of extinguishing agent*

If the quantity of extinguishing agent is intended for more than one space, the quantity of extinguishing agent available does not need to be greater than the quantity required for the largest of the spaces thus protected.

9.3.2.40.2.9 *Installation, maintenance, monitoring and documents*

- (a) The mounting or modification of the system shall only be performed by a company specialised in fire-extinguishing systems. The instructions (product data sheet, safety data sheet) provided by the manufacturer of the extinguishing agent or the system shall be followed.
- (b) The system shall be inspected by an expert:
 - (i) before being brought into service;
 - (ii) each time it is put back into service after activation;
 - (iii) after every modification or repair;
 - (iv) regularly, not less than every two years.
- (c) During the inspection, the expert is required to check that the system conforms to the requirements of 9.3.2.40.2.
- (d) The inspection shall include, as a minimum:
 - (i) an external inspection of the entire system;
 - (ii) an inspection to ensure that the piping is leakproof;
 - (iii) an inspection to ensure that the control and activation systems are in good working order;
 - (iv) an inspection of the pressure and contents of tanks;
 - (v) an inspection to ensure that the means of closing the space to be protected are leakproof;
 - (vi) an inspection of the fire alarm system;
 - (vii) an inspection of the alarm device.
- (e) The person performing the inspection shall establish, sign and date a certificate of inspection.
- (f) The number of permanently fixed fire-extinguishing systems shall be mentioned in the inspection certificate.

9.3.2.40.2.10 *Fire-extinguishing system operating with CO₂*

In addition to the requirements contained in 9.3.2.40.2.1 to 9.3.2.40.2.9, fire-extinguishing systems using CO₂ as an extinguishing agent shall conform to the following provisions:

- (a) Tanks of CO₂ shall be placed in a gastight space or cabinet separated from other spaces. The doors of such storage spaces and cabinets shall open outwards; they shall be capable of being locked and shall carry on the outside the symbol "Warning: danger", not less than 5 cm high and "CO₂" in the same colours and the same size;
- (b) Storage cabinets or spaces for CO₂ tanks located below deck shall only be accessible from the outside. These spaces shall have an artificial ventilation system with extractor hoods and shall be completely independent of the other ventilation systems on board;
- (c) The level of filling of CO₂ tanks shall not exceed 0.75 kg/l. The volume of depressurised CO₂ shall be taken to be 0.56 m³/kg;
- (d) The concentration of CO₂ in the space to be protected shall be not less than 40% of the gross volume of the space. This quantity shall be released within 120 seconds. It shall be possible to monitor whether diffusion is proceeding correctly;
- (e) The opening of the tank valves and the control of the diffusing valve shall correspond to two different operations;
- (f) The appropriate period of time mentioned in 9.3.2.40.2.6 (b) shall be not less than 20 seconds. A reliable installation shall ensure the timing of the diffusion of CO₂.

9.3.2.40.2.11 *Fire-extinguishing system operating with HFC-227 ea (heptafluoropropane)*

In addition to the requirements of 9.3.2.40.2.1 to 9.3.2.40.2.9, fire-extinguishing systems using HFC-227 ea as an extinguishing agent shall conform to the following provisions:

- (a) Where there are several spaces with different gross volumes, each space shall be equipped with its own fire-extinguishing system;
- (b) Every tank containing HFC-227 ea placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of the tank are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;
- (c) Every tank shall be fitted with a device permitting control of the gas pressure;
- (d) The level of filling of tanks shall not exceed 1.15 kg/l. The specific volume of depressurised HFC-227 ea shall be taken to be 0.1374 m³/kg;
- (e) The concentration of HFC-227 ea in the space to be protected shall be not less than 8% of the gross volume of the space. This quantity shall be released within 10 seconds;
- (f) Tanks of HFC-227 ea shall be fitted with a pressure monitoring device which triggers an audible and visual alarm in the wheelhouse in the event of an unscheduled loss of propellant gas. Where there is no wheelhouse, the alarm shall be triggered outside the space to be protected;
- (g) After discharge, the concentration in the space to be protected shall not exceed 10.5% (volume);

- (h) The fire-extinguishing system shall not comprise aluminium parts.

9.3.2.40.2.12 *Fire-extinguishing system operating with IG-541*

In addition to the requirements of 9.3.2.40.2.1 to 9.3.2.40.2.9, fire-extinguishing systems using IG-541 as an extinguishing agent shall conform to the following provisions:

- (a) Where there are several spaces with different gross volumes, every space shall be equipped with its own fire-extinguishing system;
- (b) Every tank containing IG-541 placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of the tank are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;
- (c) Each tank shall be fitted with a device for checking the contents;
- (d) The filling pressure of the tanks shall not exceed 200 bar at a temperature of +15 °C;
- (e) The concentration of IG-541 in the space to be protected shall be not less than 44% and not more than 50% of the gross volume of the space. This quantity shall be released within 120 seconds.

9.3.2.40.2.13 *Fire-extinguishing system operating with FK-5-1-12*

In addition to the requirements of 9.3.2.40.2.1 to 9.3.2.40.2.9, fire-extinguishing systems using FK-5-1-12 as an extinguishing agent shall comply with the following provisions:

- (a) Where there are several spaces with different gross volumes, every space shall be equipped with its own fire-extinguishing system;
- (b) Every tank containing FK-5-1-12 placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of the tank are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;
- (c) Every tank shall be fitted with a device permitting control of the gas pressure;
- (d) The level of filling of tanks shall not exceed 1.00 kg/l. The specific volume of depressurized FK-5-1-12 shall be taken to be 0.0719 m³/kg;
- (e) The volume of FK-5-1-12 in the space to be protected shall be not less than 5.5% of the gross volume of the space. This quantity shall be released within 10 seconds;
- (f) Tanks of FK-5-1-12 shall be fitted with a pressure monitoring device which triggers an audible and visual alarm in the wheelhouse in the event of an unscheduled loss of extinguishing agent. Where there is no wheelhouse, the alarm shall be triggered outside the space to be protected;
- (g) After discharge, the concentration in the space to be protected shall not exceed 10.0%.

9.3.2.40.2.14 *Fixed fire-extinguishing system for physical protection*

In order to ensure physical protection in the engine rooms, boiler rooms and pump rooms, permanently fixed fire-extinguishing systems are accepted solely on the basis of recommendations by the Administrative Committee.

9.3.2.40.3 The two hand fire-extinguishers referred to in 8.1.4 shall be located in the cargo area.

9.3.2.40.4 The fire-extinguishing agent and the quantity contained in the permanently fixed fire-extinguishing system shall be suitable and sufficient for fighting fires.

9.3.2.41 *Fire and naked light*

9.3.2.41.1 The outlets of funnels shall be located not less than 2.00 m from the cargo area. Arrangements shall be provided to prevent the escape of sparks and the entry of water.

9.3.2.41.2 Heating, cooking and refrigerating appliances shall not be fuelled with liquid fuels, liquid gas or solid fuels.

The installation in the engine room or in another separate space of heating appliances fuelled with liquid fuel having a flash-point above 55 °C is, however, permitted.

Cooking and refrigerating appliances are permitted only in the accommodation.

9.3.2.41.3 Only electrical lighting appliances are permitted.

9.3.2.42 *Cargo heating system*

9.3.2.42.1 Boilers which are used for heating the cargo shall be fuelled with a liquid fuel having a flashpoint of more than 55 °C. They shall be placed either in the engine room or in another separate space below deck and outside the cargo area, which is accessible from the deck or from the engine room.

9.3.2.42.2 The cargo heating system shall be designed so that the cargo cannot penetrate into the boiler in the case of a leak in the heating coils. A cargo heating system with artificial draught shall be ignited electrically.

9.3.2.42.3 The ventilation system of the engine room shall be designed taking into account the air required for the boiler.

9.3.2.42.4 Where the cargo heating system is used during loading, unloading or gas-freeing, the service space which contains this system shall fully comply with the requirements of 9.3.2.52.3. This requirement does not apply to the inlets of the ventilation system. These inlets shall be located at a minimum distance of 2 m from the cargo area and 6 m from the openings of cargo tanks or residual cargo tanks, loading pumps situated on deck, openings of high velocity vent valves, pressure relief devices and shore connections of loading and unloading pipes and must be located not less than 2 m above the deck.

The requirements of 9.3.2.52.3 are not applicable to the unloading of substances having a flash point of 60 °C or more when the temperature of the product is at least 15 K lower at the flash point.

9.3.2.43-
9.3.2.49 (*Reserved*)

9.3.2.50 Documents concerning electrical installations

9.3.2.50.1 In addition to the documents required in accordance with the Regulations referred to in 1.1.4.6, the following documents shall be on board:

- (a) a drawing indicating the boundaries of the cargo area and the location of the electrical equipment installed in this area;
- (b) a list of the electrical equipment referred to in (a) above including the following particulars:

machine or appliance, location, type of protection, type of protection against explosion, testing body and approval number;

- (c) a list of or general plan indicating the electrical equipment outside the cargo area which may be operated during loading, unloading or gas-freeing. All other electrical equipment shall be marked in red. See 9.3.2.52.3 and 9.3.2.52.4.

9.3.2.50.2 The documents listed above shall bear the stamp of the competent authority issuing the certificate of approval.

9.3.2.51 Electrical installations

9.3.2.51.1 Only distribution systems without return connection to the hull are permitted:

This provision does not apply to:

- active cathodic corrosion protection;
- local installations outside the cargo area (e.g. connections of starters of diesel engines);
- the device for checking the insulation level referred to in 9.3.2.51.2 below.

9.3.2.51.2 Every insulated distribution network shall be fitted with an automatic device with a visual and audible alarm for checking the insulation level.

9.3.2.51.3 For the selection of electrical equipment to be used in zones presenting an explosion risk, the explosion groups and temperature classes assigned to the substances carried in accordance with columns (15) and (16) of Table C of Chapter 3.2 shall be taken into consideration.

9.3.2.52 Type and location of electrical equipment

9.3.2.52.1 (a) Only the following equipment may be installed in cargo tanks, residual cargo tanks and pipes for loading and unloading (comparable to zone 0):

- measuring, regulation and alarm devices of the EEx (ia) type of protection.

(b) Only the following equipment may be installed in the cofferdams, double-hull spaces, double bottoms and hold spaces (comparable to zone 1):

- measuring, regulation and alarm devices of the certified safe type;
- lighting appliances of the “flame-proof enclosure” or “pressurised enclosure” type of protection;

- hermetically sealed echo sounding devices the cables of which are led through thick-walled steel tubes with gastight connections up to the main deck;
 - cables for the active cathodic protection of the shell plating in protective steel tubes such as those provided for echo sounding devices.
- (c) Only the following equipment may be installed in the service spaces in the cargo area below deck (comparable to zone 1):
- measuring, regulation and alarm devices of the certified safe type;
 - lighting appliances of the “flame-proof enclosure” or “apparatus protected by pressurization” type of protection;
 - motors driving essential equipment such as ballast pumps; they shall be of the certified safe type.
- (d) The control and protective equipment of the electrical equipment referred to in paragraphs (a), (b) and (c) above shall be located outside the cargo area if they are not intrinsically safe.
- (e) The electrical equipment in the cargo area on deck (comparable to zone 1) shall be of the certified safe type.

9.3.2.52.2 Accumulators shall be located outside the cargo area.

9.3.2.52.3 (a) Electrical equipment used during loading, unloading and gas-freeing during berthing and which are located outside the cargo area shall (comparable to zone 2) be at least of the “limited explosion risk” type.

(b) This provision does not apply to:

- (i) lighting installations in the accommodation, except for switches near entrances to accommodation;
- (ii) radiotelephone installations in the accommodation or the wheelhouse;
- (iii) mobile and fixed telephone installations in the accommodation or the wheelhouse;
- (iv) electrical installations in the accommodation, the wheelhouse or the service spaces outside the cargo areas if:

1. These spaces are fitted with a ventilation system ensuring an overpressure of 0.1 kPa (0.001 bar) and none of the windows is capable of being opened; the air intakes of the ventilation system shall be located as far away as possible, however, not less than 6.00 m from the cargo area and not less than 2.00 m above the deck;

2. The spaces are fitted with a gas detection system with sensors:

- at the suction inlets of the ventilation system;
- directly at the top edge of the sill of the entrance doors of the accommodation and service spaces;

3. The gas concentration measurement is continuous;
 4. When the gas concentration reaches 20% of the lower explosive limit, the ventilators are switched off. In such a case and when the overpressure is not maintained or in the event of failure of the gas detection system, the electrical installations which do not comply with (a) above, shall be switched off. These operations shall be performed immediately and automatically and activate the emergency lighting in the accommodation, the wheelhouse and the service spaces, which shall comply at least with the "limited explosion risk" type. The switching-off shall be indicated in the accommodation and wheelhouse by visual and audible signals;
 5. The ventilation system, the gas detection system and the alarm of the switch-off device fully comply with the requirements of (a) above;
 6. The automatic switching-off device is set so that no automatic switch off may occur while the vessel is under way.
- 9.3.2.52.4 The electrical equipment which does not meet the requirements set out in 9.3.2.52.3 above together with its switches shall be marked in red. The disconnection of such equipment shall be operated from a centralised location on board.
- 9.3.2.52.5 An electric generator which is permanently driven by an engine and which does not meet the requirements of 9.3.2.52.3 above, shall be fitted with a switch capable of shutting down the excitation of the generator. A notice board with the operating instructions shall be displayed near the switch.
- 9.3.2.52.6 Sockets for the connection of signal lights and gangway lighting shall be permanently fitted to the vessel close to the signal mast or the gangway. Connecting and disconnecting shall not be possible except when the sockets are not live.
- 9.3.2.52.7 The failure of the power supply for the safety and control equipment shall be immediately indicated by visual and audible signals at the locations where the alarms are usually actuated.
- 9.3.2.53 *Earthing***
- 9.3.2.53.1 The metal parts of electrical appliances in the cargo area which are not live as well as protective metal tubes or metal sheaths of cables in normal service shall be earthed, unless they are so arranged that they are automatically earthed by bonding to the metal structure of the vessel.
- 9.3.2.53.2 The provisions of 9.3.2.53.1 above apply also to equipment having service voltages of less than 50 V.
- 9.3.2.53.3 Independent cargo tanks, metal intermediate bulk containers and tank-containers shall be earthed.
- 9.3.2.53.4 Metal intermediate bulk containers (IBCs) and tank-containers, used as residual cargo tanks or slop tanks, shall be capable of being earthed.
- 9.3.2.54-
9.3.2.55 (*Reserved*)

9.3.2.56 *Electrical cables*

- 9.3.2.56.1 All cables in the cargo area shall have a metallic sheath.
- 9.3.2.56.2 Cables and sockets in the cargo area shall be protected against mechanical damage.
- 9.3.2.56.3 Movable cables are prohibited in the cargo area, except for intrinsically safe electric circuits or for the supply of signal lights and gangway lighting.
- 9.3.2.56.4 Cables of intrinsically safe circuits shall only be used for such circuits and shall be separated from other cables not intended for being used in such circuits (e.g. they shall not be installed together in the same string of cables and they shall not be fixed by the same cable clamps).
- 9.3.2.56.5 For movable cables intended for signal lights and gangway lighting, only sheathed cables of type H 07 RN-F in accordance with standard IEC 60 245-4:1994 or cables of at least equivalent design having conductors with a cross-section of not less than 1.5 mm² shall be used.
- These cables shall be as short as possible and installed so that damage is not likely to occur.
- 9.3.2.56.6 The cables required for the electrical equipment referred to in 9.3.2.51.1 (b) and (c) are accepted in cofferdams, double-hull spaces, double bottoms, hold spaces and service spaces below deck.

9.3.2.57-
9.3.2.59 (*Reserved*)

9.3.2.60 *Special equipment*

A shower and an eye and face bath shall be provided on the vessel at a location which is directly accessible from the cargo area.

9.3.2.61-
9.3.2.70 (*Reserved*)

9.3.2.71 *Admittance on board*

The notice boards displaying the prohibition of admittance in accordance with 8.3.3 shall be clearly legible from either side of the vessel.

9.3.2.72-
9.3.2.73 (*Reserved*)

9.3.2.74 *Prohibition of smoking, fire or naked light*

- 9.3.2.74.1 The notice boards displaying the prohibition of smoking in accordance with 8.3.4 shall be clearly legible from either side of the vessel.
- 9.3.2.74.2 Notice boards indicating the circumstances under which the prohibition is applicable shall be fitted near the entrances to the spaces where smoking or the use of fire or naked light is not always prohibited.
- 9.3.2.74.3 Ashtrays shall be provided close to each exit of the accommodation and the wheelhouse.
- 9.3.2.75-
9.3.2.91 (*Reserved*)

9.3.2.92 ***Emergency exit***

Spaces the entrances or exits of which are likely to become partly or completely immersed in the damaged condition shall have an emergency exit which is situated not less than 0.10 m above the damage waterline. This requirement does not apply to forepeak and afterpeak.

9.3.2.93-
9.3.2.99 (*Reserved*)

9.3.3 **Rules for construction of type N tank vessels**

The rules for construction of 9.3.3.0 to 9.3.3.99 apply to type N tank vessels.

9.3.3.0 ***Materials of construction***

9.3.3.0.1 (a) The vessel's hull and the cargo tanks shall be constructed of shipbuilding steel or other at least equivalent metal.

The independent cargo tanks may also be constructed of other materials, provided these have at least equivalent mechanical properties and resistance against the effects of temperature and fire.

(b) Every part of the vessel including any installation and equipment which may come into contact with the cargo shall consist of materials which can neither be dangerously affected by the cargo nor cause decomposition of the cargo or react with it so as to form harmful or hazardous products.

(c) Inside vapour pipes and gas discharge pipes shall be protected against erosion.

9.3.3.0.2 Except where explicitly permitted in 9.3.3.03 below or in the certificate of approval, the use of wood, aluminium alloys or plastic materials within the cargo area is prohibited.

9.3.3.0.3 (a) The use of wood, aluminium alloys or plastic materials within the cargo area is only permitted for:

- gangways and external ladders;
- movable items of equipment (aluminium gauging rods are, however, permitted provided that they are fitted with brass feet or protected in another way to avoid sparking);
- chocking of cargo tanks which are independent of the vessel's hull and chocking of installations and equipment;
- masts and similar round timber;
- engine parts;
- parts of the electrical installation;
- loading and unloading appliances;
- lids of boxes which are placed on the deck.

- (b) The use of wood or plastic materials within the cargo area is only permitted for:
 - supports and stops of any kind.
- (c) The use of plastic materials or rubber within the cargo area is only permitted for:
 - coating of cargo tanks and of hoses for loading and unloading;
 - all kinds of gaskets (e.g. for dome or hatch covers);
 - electric cables;
 - hoses for loading and unloading;
 - insulation of cargo tanks and of hoses for loading and unloading.
- (d) All permanently fitted materials in the accommodation or wheelhouse, with the exception of furniture, shall not readily ignite. They shall not evolve fumes or toxic gases in dangerous quantities, if involved in a fire.

9.3.3.0.4 The paint used in the cargo area shall not be liable to produce sparks in case of impact.

9.3.3.0.5 The use of plastic material for vessel's boats is permitted only if the material does not readily ignite.

9.3.3.1-
9.3.3.7 (*Reserved*)

9.3.3.8 Classification

9.3.3.8.1 The tank vessel shall be built under survey of a recognised classification society in accordance with the rules established by that classification society for its highest class, and the tank vessel shall be classed accordingly.

The vessel's class shall be continued.

The classification society shall issue a certificate certifying that the vessel is in conformity with the rules of this section.

The design pressure and the test pressure of cargo tanks shall be entered in the certificate.

If a vessel has cargo tanks with different valve opening pressures, the design and test pressures of each tank shall be entered in the certificate.

The classification society shall draw up a certificate mentioning all the dangerous goods accepted for carriage by the vessel (see also 1.16.1.2.5).

9.3.3.8.2 The cargo pump-rooms shall be inspected by a recognised classification society whenever the certificate of approval has to be renewed as well as during the third year of validity of the certificate of approval. The inspection shall comprise at least:

- an inspection of the whole system for its condition, for corrosion, leakage or conversion works which have not been approved;
- a checking of the condition of the gas detection system in the cargo pump-rooms.

Inspection certificates signed by the recognised classification society with respect to the inspection of the cargo pump-rooms shall be kept on board. The inspection certificates shall at least include particulars of the above inspection and the results obtained as well as the date of the inspection.

9.3.3.8.3 The condition of the gas detection system referred to in 9.3.3.52.3 shall be checked by a recognised classification society whenever the certificate of approval has to be renewed and during the third year of validity of the certificate of approval. A certificate signed by the recognised classification society shall be kept on board.

9.3.3.8.4 9.3.3.8.2 and 9.3.3.8.3, checking of the condition of the gas detection system, do not apply to open type N.

9.3.3.9 (*Reserved*)

9.3.3.10 *Protection against the penetration of gases*

9.3.3.10.1 The vessel shall be designed so as to prevent gases from penetrating into the accommodation and the service spaces.

9.3.3.10.2 Outside the cargo area, the lower edges of door-openings in the sidewalls of superstructures and the coaming of access hatches to under-deck spaces shall have a height of not less than 0.50 m above the deck.

This requirement need not be complied with if the wall of the superstructures facing the cargo area extends from one side of the ship to the other and has doors the sills of which have a height of not less than 0.50 m above the deck. The height of this wall shall be not less than 2.00 m. In this case, the lower edges of door-openings in the sidewalls of superstructures and the coamings of access hatches behind this wall shall have a height of not less than 0.10 m above the deck. The sills of engine room doors and the coamings of its access hatches shall, however, always have a height of not less than 0.50 m.

9.3.3.10.3 In the cargo area, the lower edges of door-openings in the sidewalls of superstructures shall have a height of not less than 0.50 m above the deck and the sills of hatches and ventilation openings of premises located under the deck shall have a height of not less than 0.50 m above the deck. This requirement does not apply to access openings to double-hull and double bottom spaces.

9.3.3.10.4 The bulwarks, foot-rails etc. shall be provided with sufficiently large openings which are located directly above the deck.

9.3.3.10.5 9.3.3.10.1 to 9.3.3.10.4 above do not apply to open type N.

9.3.3.11 *Hold spaces and cargo tanks*

- 9.3.3.11.1 (a) The maximum permissible capacity of a cargo tank shall be determined in accordance with the following table:

$L \times B \times H$ (m ³)	Maximum permissible capacity of a cargo tank (m ³)
up to 600	$L \times B \times H \times 0.3$
600 to 3 750	$180 + (L \times B \times H - 600) \times 0.0635$
> 3 750	380

Alternative constructions in accordance with 9.3.4 are permitted.

In the table above $L \times B \times H$ is the product of the main dimensions of the tank vessel in metres (according to the measurement certificate), where:

L = overall length of the hull in m;

B = extreme breadth of the hull in m;

H = shortest vertical distance between the top of the keel and the lowest point of the deck at the side of the vessel (moulded depth) within the cargo area in m;

where:

For trunk vessels, H shall be replaced by H', where H' shall be obtained from the following formula:

$$H' = H + \left(ht \times \frac{bt}{B} \times \frac{lt}{L} \right)$$

where:

ht = trunk height (distance between trunk deck and main deck measured on trunk side at L/2) in m;

bt = trunk breadth in m;

lt = trunk length in m.

- (b) The relative density of the substances to be carried shall be taken into consideration in the design of the cargo tanks. The maximum relative density shall be indicated in the certificate of approval.
- (c) When the vessel is provided with pressure tanks, these tanks shall be designed for a working pressure of 400 kPa (4 bar).
- (d) For vessels with a length of not more than 50.00 m, the length of a cargo tank shall not exceed 10.00 m; and

For vessels with a length of more than 50.00 m, the length of a cargo tank shall not exceed 0.20 L.

This provision does not apply to vessels with independent built-in cylindrical tanks having a length to diameter ratio ≤ 7 .

- 9.3.3.11.2 (a) The cargo tanks independent of the vessel's hull shall be fixed so that they cannot float.
- (b) The capacity of a suction well shall be limited to not more than 0.10 m³.
- 9.3.3.11.3 (a) The cargo tanks shall be separated by cofferdams of at least 0.60 m in width from the accommodation, engine room and service spaces outside the cargo area below deck or, if there are no such accommodation, engine room and service spaces, from the vessel's ends. Where the cargo tanks are installed in a hold space, a space of not less than 0.50 m shall be provided between such tanks and the end bulkheads of the hold space. In this case an insulated end bulkhead meeting the definition for Class "A-60" according to SOLAS 74, Chapter II-2, Regulation 3, shall be deemed equivalent to a cofferdam. For pressure cargo tanks, the 0.50 m distance may be reduced to 0.20 m.
- (b) Hold spaces, cofferdams and cargo tanks shall be capable of being inspected.
- (c) All spaces in the cargo area shall be capable of being ventilated. Means for checking their gas-free condition shall be provided.
- 9.3.3.11.4 The bulkheads bounding the cargo tanks, cofferdams and hold spaces shall be watertight. The cargo tanks and the bulkheads bounding the cargo area shall have no openings or penetrations below deck.
- The bulkhead between the engine room and the cofferdam or service space in the cargo area or between the engine room and a hold space may be fitted with penetrations provided that they conform to the provisions of 9.3.3.17.5.
- The bulkhead between the cargo tank and the cargo pump-room below deck may be fitted with penetrations provided that they conform to the provisions of 9.3.3.17.6. The bulkheads between the cargo tanks may be fitted with passages provided that the unloading pipes are fitted with shut-off devices in the cargo tank from which they come. The shut-off devices shall be capable of being activated from the deck.
- 9.3.3.11.5 Double-hull spaces and double bottoms in the cargo area shall be arranged for being filled with ballast water only. Double bottoms may, however, be used as oil fuel tanks, provided they comply with the provisions of 9.3.3.32.
- 9.3.3.11.6 (a) A cofferdam, the centre part of a cofferdam or another space below deck in the cargo area may be arranged as a service space, provided the bulkheads bounding the service space extend vertically to the bottom. This service space shall only be accessible from the deck.
- (b) The service space shall be watertight with the exception of its access hatches and ventilation inlets.
- (c) No pipes for loading and unloading shall be fitted within the service space referred to under 9.3.3.11.4 above.
- Pipes for loading and unloading may be fitted in the cargo pump-rooms below deck only when they conform to the provisions of 9.3.3.17.6.
- 9.3.3.11.7 For double-hull construction with the tanks integrated in the vessel's structure or where hold spaces contain cargo tanks which are independent of the structure of the vessel, or where independent cargo tanks are used, or for double-hull construction where the cargo tanks are integrated in vessel's structure, the space between the wall of the vessel and wall of the cargo tanks shall be not less than 0.60 m.

The space between the bottom of the vessel and the bottom of the cargo tanks shall be not less than 0.50 m. The space may be reduced to 0.40 m under the pump sumps.

The vertical space between the suction well of a cargo tank and the bottom structures shall be not less than 0.10 m.

When a hull is constructed in the cargo area as a double hull with independent cargo tanks located in hold spaces, the above values are applicable to the double hull. If in this case the minimum values for inspections of independent tanks referred to in 9.3.3.11.9 are not feasible, it must be possible to remove the cargo tanks easily for inspection.

9.3.3.11.8 Where service spaces are located in the cargo area under deck, they shall be arranged so as to be easily accessible and to permit persons wearing protective clothing and breathing apparatus to safely operate the service equipment contained therein. They shall be designed so as to allow injured or unconscious personnel to be removed from such spaces without difficulties, if necessary by means of fixed equipment.

9.3.3.11.9 Cofferdams, double-hull spaces, double bottoms, cargo tanks, hold spaces and other accessible spaces within the cargo area shall be arranged so that they may be completely inspected and cleaned. The dimensions of openings except for those of double-hull spaces and double bottoms which do not have a wall adjoining the cargo tanks shall be sufficient to allow a person wearing breathing apparatus to enter or leave the space without difficulties. These openings shall have a minimum cross-section of 0.36 m² and a minimum side length of 0.50 m. They shall be designed so as to allow injured or unconscious personnel to be removed from the bottom of such a space without difficulties, if necessary by means of fixed equipment. In these spaces the free penetration width shall not be less than 0.50 m in the sector intended for the penetration. In double bottoms this distance may be reduced to 0.45 m.

Cargo tanks may have circular openings with a diameter of not less than 0.68 m.

9.3.3.11.10 9.3.3.11.6 (c) above does not apply to open type N.

9.3.3.12 *Ventilation*

9.3.3.12.1 Each hold space shall have two openings the dimensions and location of which shall be such as to permit effective ventilation of any part of the hold space. If there are no such openings, it shall be possible to fill the hold spaces with inert gas or dry air.

9.3.3.12.2 Double-hull spaces and double bottoms within the cargo area which are not arranged for being filled with ballast water, hold spaces and cofferdams shall be provided with ventilation systems.

9.3.3.12.3 Any service spaces located in the cargo area below deck shall be provided with a system of forced ventilation with sufficient power for ensuring at least 20 changes of air per hour based on the volume of the space.

The ventilation exhaust ducts shall be located up to 50 mm above the bottom of the service space. The fresh air inlets shall be located in the upper part; they shall be not less than 2.00 m above the deck, not less than 2.00 m from the openings of the cargo tanks and not less than 6.00 m from the outlets of safety valves.

The extension pipes which may be necessary may be of the hinged type.

On board open type N vessels other suitable installations without ventilator fans shall be sufficient.

9.3.3.12.4 Ventilation of accommodation and service spaces shall be possible.

9.3.3.12.5 Ventilators used in the cargo area shall be designed so that no sparks may be emitted on contact of the impeller blades with the housing and no static electricity may be generated.

9.3.3.12.6 Notice boards shall be fitted at the ventilation inlets indicating the conditions when they shall be closed. Any ventilation inlets of accommodation and service spaces leading outside shall be fitted with fire flaps. Such ventilation inlets shall be located not less than 2.00 m from the cargo area.

Ventilation inlets of service spaces in the cargo area below deck may be located within such area.

9.3.3.12.7 Flame-arresters prescribed in 9.3.3.20.4, 9.3.3.22.4, 9.3.3.22.5 and 9.3.3.26.4 shall be of a type approved for this purpose by the competent authority.

9.3.3.12.8 9.3.3.12.5, 9.3.3.12.6 and 9.3.3.12.7 above do not apply to open type N.

9.3.3.13 *Stability (general)*

9.3.3.13.1 Proof of sufficient stability shall be furnished. This proof is not required for single hull vessels with cargo tanks the width of which is not more than 0.70 B.

9.3.3.13.2 The basic values for the stability calculation - the vessel's lightweight and location of the centre of gravity - shall be determined either by means of an inclining experiment or by detailed mass and moment calculation. In the latter case the lightweight of the vessel shall be checked by means of a lightweight test with a tolerance limit of $\pm 5\%$ between the mass determined by calculation and the displacement determined by the draught readings.

9.3.3.13.3 Proof of sufficient intact stability shall be furnished for all stages of loading and unloading and for the final loading condition.

For vessels with independent cargo tanks and for double-hull constructions with cargo tanks integrated in the frames of the vessel, floatability after damage shall be proved for the most unfavourable loading condition. For this purpose, calculated proof of sufficient stability shall be established for critical intermediate stages of flooding and for the final stage of flooding. Negative values of stability in intermediate stages of flooding may be accepted only if the continued range of curve of the righting lever in damaged condition indicates adequate positive values of stability.

9.3.3.14 *Stability (intact)*

9.3.3.14.1 For vessels with independent cargo tanks and for double-hull constructions with cargo tanks integrated in the frames of the vessel, the requirements for intact stability resulting from the damage stability calculation shall be fully complied with.

9.3.3.14.2 For vessels with cargo tanks of more than 0.70 B in width, proof shall be furnished that the following stability requirements have been complied with:

- (a) In the positive area of the righting lever curve up to immersion of the first non-watertight opening there shall be a righting lever (GZ) of not less than 0.10 m;
- (b) The surface of the positive area of the righting lever curve up to immersion of the first non-watertight opening and in any event up to an angle of heel $\leq 27^\circ$ shall not be less than 0.024 m.rad;
- (c) The metacentric height (GM) shall be not less than 0.10 m.

These conditions shall be met bearing in mind the influence of all free surfaces in tanks for all stages of loading and unloading.

9.3.3.15 *Stability (damaged condition)*

9.3.3.15.1 For vessels with independent cargo tanks and for double-hull constructions with cargo tanks integrated in the frames of the vessel, the following assumptions shall be taken into consideration for the damaged condition:

(a) The extent of side damage is as follows:

longitudinal extent: at least 0.10 L, but not less than 5.00 m;
transverse extent: 0.59 m;
vertical extent: from the base line upwards without limit.

(b) The extent of bottom damage is as follows:

longitudinal extent: at least 0.10 L, but not less than 5.00 m;
transverse extent: 3.00 m;
vertical extent: from the base 0.49 m upwards, the sump excepted.

(c) Any bulkheads within the damaged area shall be assumed damaged, which means that the location of bulkheads shall be chosen so as to ensure that the vessel remains afloat after the flooding of two or more adjacent compartments in the longitudinal direction.

The following provisions are applicable:

- For bottom damage, adjacent athwartship compartments shall also be assumed as flooded;
- The lower edge of any non-watertight openings (e.g. doors, windows, access hatchways) shall, at the final stage of flooding, be not less than 0.10 m above the damage waterline;
- In general, permeability shall be assumed to be 95%. Where an average permeability of less than 95% is calculated for any compartment, this calculated value obtained may be used.

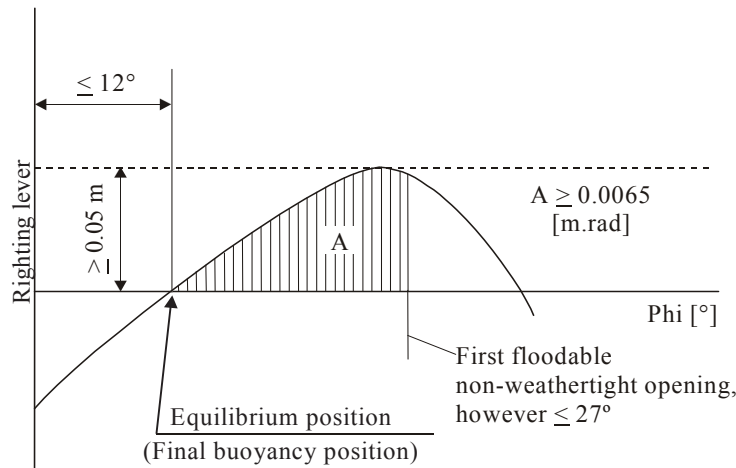
However, the following minimum values shall be used:

- engine rooms: 85%;
- accommodation: 95%;
- double bottoms, oil fuel tanks, ballast tanks, etc., depending on whether, according to their function, they have to be assumed as full or empty for the vessel floating at the maximum permissible draught: 0% or 95%.

For the main engine room only the one-compartment standard need be taken into account, i.e. the end bulkheads of the engine room shall be assumed as not damaged.

9.3.3.15.2 At the stage of equilibrium (final stage of flooding), the angle of heel shall not exceed 12°. Non-watertight openings shall not be flooded before reaching the stage of equilibrium. If such openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purpose of the stability calculation.

The positive range of the righting lever curve beyond the stage of equilibrium shall have a righting lever of ≥ 0.05 m in association with an area under the curve of ≥ 0.0065 m.rad. The minimum values of stability shall be satisfied up to immersion of the first non-watertight opening and in any event up to an angle of heel $\leq 27^\circ$. If non-watertight openings are immersed before that stage, the corresponding spaces shall be considered as flooded for the purposes of stability calculation.



9.3.3.15.3 If openings through which undamaged compartments may additionally become flooded are capable of being closed watertight, the closing appliances shall be marked accordingly.

9.3.3.15.4 Where cross- or down-flooding openings are provided for reduction of unsymmetrical flooding, the time for equalization shall not exceed 15 minutes, if during the intermediate stages of flooding sufficient stability has been proved.

9.3.3.16 *Engine rooms*

9.3.3.16.1 Internal combustion engines for the vessel's propulsion as well as internal combustion engines for auxiliary machinery shall be located outside the cargo area. Entrances and other openings of engine rooms shall be at a distance of not less than 2.00 m from the cargo area.

9.3.3.16.2 The engine rooms shall be accessible from the deck; the entrances shall not face the cargo area. Where the doors are not located in a recess whose depth is at least equal to the door width, the hinges shall face the cargo area.

9.3.3.16.3 The last sentence of 9.3.3.16.2 does not apply to oil separator or supply vessels.

9.3.3.17 *Accommodation and service spaces*

9.3.3.17.1 Accommodation spaces and the wheelhouse shall be located outside the cargo area forward of the fore vertical plane or abaft the aft vertical plane bounding the part of cargo area below deck. Windows of the wheelhouse which are located not less than 1.00 m above the bottom of the wheelhouse may tilt forward.

9.3.3.17.2 Entrances to spaces and openings of superstructures shall not face the cargo area. Doors opening outward and not located in a recess whose depth is at least equal to the width of the doors shall have their hinges face the cargo area.

9.3.3.17.3 Entrances from the deck and openings of spaces facing the weather shall be capable of being closed. The following instruction shall be displayed at the entrance of such spaces:

**Do not open during loading and unloading without
the permission of the master.
Close immediately.**

9.3.3.17.4 Entrances and windows of superstructures and accommodation spaces which can be opened as well as other openings of these spaces shall be located not less than 2.00 m from the cargo area. No wheelhouse doors and windows shall be located within 2.00 m from the cargo area, except where there is no direct connection between the wheelhouse and the accommodation.

- 9.3.3.17.5
- (a) Driving shafts of the bilge or ballast pumps may penetrate through the bulkhead between the service space and the engine room, provided the arrangement of the service space is in compliance with 9.3.3.11.6.
 - (b) The penetration of the shaft through the bulkhead shall be gastight and shall have been approved by a recognised classification society.
 - (c) The necessary operating instructions shall be displayed.
 - (d) Penetrations through the bulkhead between the engine room and the service space in the cargo area and the bulkhead between the engine room and the hold spaces may be provided for electrical cables, hydraulic lines and piping for measuring, control and alarm systems, provided that the penetrations have been approved by a recognised classification society. The penetrations shall be gastight. Penetrations through a bulkhead with an "A-60" fire protection insulation according to SOLAS 74, Chapter II-2, Regulation 3, shall have an equivalent fire protection.
 - (e) Pipes may penetrate the bulkhead between the engine room and the service space in the cargo area provided that these are pipes between the mechanical equipment in the engine room and the service space which do not have any openings within the service space and which are provided with shut-off devices at the bulkhead in the engine room.
 - (f) Notwithstanding 9.3.3.11.4, pipes from the engine room may pass through the service space in the cargo area or a cofferdam or a hold space or a double-hull space to the outside provided that within the service space or cofferdam or hold space or double-hull space they are of the thick-walled type and have no flanges or openings.
 - (g) Where a driving shaft of auxiliary machinery penetrates through a wall located above the deck the penetration shall be gastight.

9.3.3.17.6 A service space located within the cargo area below deck shall not be used as a cargo pump-room for the loading and unloading system, except where:

- the cargo pump-room is separated from the engine room or from service spaces outside the cargo area by a cofferdam or a bulkhead with an "A-60" fire protection insulation according to SOLAS 74, Chapter II-2, Regulation 3, or by a service space or a hold space;
- the "A-60" bulkhead required above does not include penetrations referred to in 9.3.3.17.5 (a);
- ventilation exhaust outlets are located not less than 6.00 m from entrances and openings of the accommodation and service spaces outside the cargo area;

- the access hatches and ventilation inlets can be closed from the outside;
- all pipes for loading and unloading as well as those of stripping systems are provided with shut-off devices at the pump suction side in the cargo pump-room immediately at the bulkhead. The necessary operation of the control devices in the pump-room, starting of pumps and necessary control of the liquid flow rate shall be effected from the deck;
- the bilge of the cargo pump-room is equipped with a gauging device for measuring the filling level which activates a visual and audible alarm in the wheelhouse when liquid is accumulating in the cargo pump-room bilge;
- the cargo pump-room is provided with a permanent gas detection system which automatically indicates the presence of explosive gases or lack of oxygen by means of direct-measuring sensors and which actuates a visual and audible alarm when the gas concentration has reached 20% of the lower explosive limit. The sensors of this system shall be placed at suitable positions at the bottom and directly below the deck.

Measurement shall be continuous.

The audible and visual alarms are installed in the wheelhouse and in the cargo pump-room and, when the alarm is actuated, the loading and unloading system is shut down. Failure of the gas detection system shall be immediately signalled in the wheelhouse and on deck by means of audible and visual alarms;

- the ventilation system prescribed in 9.3.3.12.3 has a capacity of not less than 30 changes of air per hour based on the total volume of the service space.

9.3.3.17.7 The following instruction shall be displayed at the entrance of the cargo pump-room:

**Before entering the cargo pump-room check whether
it is free from gases and contains sufficient oxygen.
Do not open doors and entrance openings without
the permission of the master.
Leave immediately in the event of alarm.**

9.3.3.17.8 9.3.3.17.5 (g), 9.3.3.17.6 and 9.3.3.17.7 do not apply to open type N.

9.3.3.17.2, last sentence, 9.3.3.17.3, last sentence and 9.3.3.17.4 do not apply to oil separator and supply vessels.

9.3.3.18 *Inerting facility*

In cases in which inerting or blanketing of the cargo is prescribed, the vessel shall be equipped with an inerting system.

This system shall be capable of maintaining a permanent minimum pressure of 7 kPa (0.07 bar) in the spaces to be inerted. In addition, the inerting system shall not increase the pressure in the cargo tank to a pressure greater than that at which the pressure valve is regulated. The set pressure of the vacuum-relief valve shall be 3.5 kPa.

A sufficient quantity of inert gas for loading or unloading shall be carried or produced on board if it is not possible to obtain it on shore. In addition, a sufficient quantity of inert gas to offset normal losses occurring during carriage shall be on board.

The premises to be inerted shall be equipped with connections for introducing the inert gas and monitoring systems so as to ensure the correct atmosphere on a permanent basis.

When the pressure or the concentration of inert gas in the gaseous phase falls below a given value, this monitoring system shall activate an audible and visible alarm in the wheelhouse. When the wheelhouse is unoccupied, the alarm shall also be perceptible in a location occupied by a crew member.

9.3.3.19 (Reserved)

9.3.3.20 Arrangement of cofferdams

9.3.3.20.1 Cofferdams or cofferdam compartments remaining once a service space has been arranged in accordance with 9.3.3.11.6 shall be accessible through an access hatch.

If, however, the cofferdam is connected to a double-hull space, it is sufficient for it to be accessible from that space. For openings giving access to double-hull spaces on deck the last sentence of 9.3.2.10.3 remains applicable. In this case an arrangement shall be made for possible monitoring in order to ascertain from the deck whether the cofferdam is empty.

9.3.3.20.2 Cofferdams shall be capable of being filled with water and emptied by means of a pump. Filling shall be effected within 30 minutes. These requirements are not applicable when the bulkhead between the engine room and the cofferdam has an "A-16" fire protection insulation according to SOLAS 74, Chapter II-2, Regulation 3.

The cofferdams shall not be fitted with inlet valves.

9.3.3.20.3 No fixed pipe shall permit connection between a cofferdam and other piping of the vessel outside the cargo area.

9.3.3.20.4 The ventilation openings of cofferdams shall be fitted with a flame-arrester.

9.3.3.20.5 9.3.3.20.4 above does not apply to open type N.

9.3.3.20.2 above does not apply to oil separator and supply vessels.

9.3.3.21 Safety and control installations

9.3.3.21.1 Cargo tanks shall be provided with the following equipment:

- (a) a mark inside the tank indicating the liquid level of 97%;
- (b) a level gauge;
- (c) a level alarm device which is activated at the latest when a degree of filling of 90% is reached;
- (d) a high level sensor for actuating the facility against overflowing when a degree of filling of 97.5% is reached;
- (e) an instrument for measuring the pressure of the vapour phase inside the cargo tank;
- (f) an instrument for measuring the temperature of the cargo if in column (9) of Table C of Chapter 3.2 a heating installation is required or if in column (20) a possibility of heating the cargo is required or if a maximum temperature is indicated;

- (g) a connection for a sampling device, closed or partially closed, and/or at least one sampling opening as required in column (13) of Table C of Chapter 3.2.

9.3.3.21.2 When the degree of filling in per cent is determined, an error of not more than 0.5% is permitted. It shall be calculated on the basis of the total cargo tank capacity including the expansion trunk.

9.3.3.21.3 The level gauge shall allow readings from the control position of the shut-off devices of the particular cargo tank. The permissible maximum filling level of the cargo tank shall be marked on each level gauge.

Permanent reading of the overpressure and vacuum shall be possible from a location from which loading or unloading operations may be interrupted. The permissible maximum overpressure and vacuum shall be marked on each level gauge.

Readings shall be possible in all weather conditions.

9.3.3.21.4 The level alarm device shall give a visual and audible warning on board when actuated. The level alarm device shall be independent of the level gauge.

9.3.3.21.5 (a) The high level sensor referred to in 9.3.3.21.1 (d) above shall give a visual and audible alarm on board and at the same time actuate an electrical contact which in the form of a binary signal interrupts the electric current loop provided and fed by the shore facility, thus initiating measures at the shore facility against overflowing during loading operations. The signal shall be transmitted to the shore facility via a watertight two-pin plug of a connector device in accordance with standard EN 60309-2:1999 for direct current of 40 to 50 volts, identification colour white, position of the nose 10 h.

The plug shall be permanently fitted to the vessel close to the shore connections of the loading and unloading pipes.

The high level sensor shall also be capable of switching off the vessel's own discharging pump.

The high level sensor shall be independent of the level alarm device, but it may be connected to the level gauge.

(b) On board oil separator vessels the sensor referred to in 9.3.3.21.1 (d) shall activate a visual and audible alarm and switch off the pump used to evacuate bilge water.

(c) Supply vessels and other vessels which may be delivering products required for operation shall be equipped with a transshipment facility compatible with European standard EN 12 827:1996 and a rapid closing device enabling refuelling to be interrupted. It shall be possible to actuate this rapid closing device by means of an electrical signal from the overflow prevention system. The electrical circuits actuating the rapid closing device shall be secured according to the quiescent current principle or other appropriate error detection measures. The state of operation of electrical circuits which cannot be controlled using the quiescent current principle shall be capable of being easily checked.

It shall be possible to actuate the rapid closing device independently of the electrical signal.

The rapid closing device shall actuate a visual and an audible alarm on board.

(d) During discharging by means of the on-board pump, it shall be possible for the shore facility to switch it off. For this purpose, an independent intrinsically safe power line,

fed by the vessel, shall be switched off by the shore facility by means of an electrical contact.

It shall be possible for the binary signal of the shore facility to be transmitted via a watertight two-pole socket or a connector device in accordance with standard EN 60309-2:1999, for direct current of 40 to 50 volts, identification colour white, position of the nose 10 h.

This socket shall be permanently fitted to the vessel close to the shore connections of the unloading pipes.

- 9.3.3.21.6 The visual and audible signals given by the level alarm device shall be clearly distinguishable from those of the high level sensor.

The visual alarm shall be visible at each control position on deck of the cargo tank stop valves. It shall be possible to easily check the functioning of the sensors and electric circuits or these shall be intrinsically safe apparatus.

- 9.3.3.21.7 When the pressure or temperature exceeds a set value, instruments for measuring the vacuum or overpressure of the gaseous phase in the cargo tank or the temperature of the cargo, shall activate a visual and audible alarm in the wheelhouse. When the wheelhouse is unoccupied, the alarm shall also be perceptible in a location occupied by a crew member.

When the pressure exceeds the set value during loading, the instrument for measuring the pressure shall, by means of the plug referred to in 9.3.3.21.5, initiate simultaneously an electrical contact which shall put into effect measures to interrupt the loading operation. If the vessel's own discharge pump is used, it shall be switched off automatically.

The instrument for measuring the overpressure or vacuum shall activate the alarm at latest when an overpressure equal to 1.15 times the opening pressure of the pressure relief device, or a vacuum pressure equal to the construction vacuum pressure but not exceeding 5 kPa. The maximum allowable temperature is indicated in column (20) of Table C of Chapter 3.2. The sensors for the alarms mentioned in this paragraph may be connected to the alarm device of the sensor.

When it is prescribed in column (20) of Table C of Chapter 3.2 the instrument for measuring the overpressure of the gaseous phase shall activate a visible and audible alarm in the wheelhouse when the overpressure exceeds 40 kPa during the voyage. When the wheelhouse is unoccupied, the alarm shall also be perceptible in a location occupied by a crew member.

- 9.3.3.21.8 Where the control elements of the shut-off devices of the cargo tanks are located in a control room, it shall be possible to stop the loading pumps and read the level gauges in the control room, and the visual and audible warning given by the level alarm device, the high level sensor referred to in 9.3.3.21.1 (d) and the instruments for measuring the pressure and temperature of the cargo shall be noticeable in the control room and on deck.

Satisfactory monitoring of the cargo area shall be ensured from the control room.

- 9.3.3.21.9 9.3.3.21.1 (e), 9.3.3.21.7 as regards measuring the pressure, do not apply to open type N with flame-arrester and to open type N.

9.3.3.21.1 (b), (c) and (g), 9.3.3.21.3 and 9.3.3.21.4 do not apply to oil separator and supply vessels.

Screens in sampling openings are not required on board open type N tank vessels.

9.3.3.21.1 (f) and 9.3.3.21.7 do not apply to supply vessels.

9.3.3.21.5 (a) does not apply to oil separator vessels.

9.3.3.22 *Cargo tank openings*

- 9.3.3.22.1 (a) Cargo tank openings shall be located on deck in the cargo area.
- (b) Cargo tank openings with a cross-section of more than 0.10 m² and openings of safety devices for preventing overpressures shall be located not less than 0.50 m above deck.
- 9.3.3.22.2 Cargo tank openings shall be fitted with gastight closures capable of withstanding the test pressure in accordance with 9.3.3.23.1.
- 9.3.3.22.3 Closures which are normally used during loading or unloading operations shall not cause sparking when operated.
- 9.3.3.22.4 (a) Each cargo tank or group of cargo tanks connected to a common vapour pipe shall be fitted with safety devices for preventing unacceptable overpressures or vacuums.

These safety devices shall be as follows:

for the open N type:

- safety devices designed to prevent any accumulation of water and its penetration into the cargo tanks;

for the open N type with flame-arresters:

- safety equipment fitted with flame-arresters capable of withstanding steady burning and designed to prevent any accumulation of water and its penetration into the cargo tank;

for the closed N type:

- safety devices for preventing unacceptable overpressure or vacuum. Where anti-explosion protection is required in column (17) of Table C of Chapter 3.2, the vacuum valve shall be fitted with a flame arrester capable of withstanding a deflagration and the pressure relief valve with a high-velocity vent valve acting as a flame arrester capable of withstanding steady burning. Gases shall be discharged upwards. The opening pressure of the high-velocity vent valve and the opening pressure of the vacuum valve shall be permanently marked on the valves.
- a connection for the safe return ashore of gases expelled during loading;
- a device for the safe depressurisation of the cargo tanks consisting of at least a flame-arresters and a stop valve the position of which shall clearly indicate whether it is open or shut.

- (b) The outlets of high-velocity vent valves shall be located not less than 2.00 m above the deck and at a distance of not less than 6.00 m from the accommodation and from the service spaces outside the cargo area. This height may be reduced when within a radius of 1.00 m round the outlet of the high-velocity vent valve, there is no equipment, no work is being carried out and signs indicate the area. The setting of the high-velocity vent valves shall be such that during the transport operation they do not

blow off until the maximum permissible working pressure of the cargo tanks is reached.

- 9.3.3.22.5 (a) Insofar as anti-explosion protection is prescribed in column (17) of Table C of Chapter 3.2, a vapour pipe connecting two or more cargo tanks shall be fitted, at the connection to each cargo tank, with a flame arrester with a fixed or spring-loaded plate stack, capable of withstanding detonation. This equipment may consist of:
- (i) a flame arrester fitted with a fixed plate stack, where each cargo tank is fitted with a vacuum valve capable of withstanding a deflagration and a high-velocity vent valve capable of withstanding steady burning;
 - (ii) a flame arrester fitted with a spring-loaded plate stack, where each cargo tank is fitted with a vacuum valve capable of withstanding a deflagration;
 - (iii) a flame arrester with a fixed plate stack;
 - (iv) a flame arrester with a fixed plate stack, where the pressure measurement device is fitted with an alarm system in accordance with 9.3.3.21.7;
 - (v) a flame arrester with a spring-loaded plate stack, where the pressure measurement device is fitted with an alarm system in accordance with 9.3.3.21.7.

Only substances which do not mix and which do not react dangerously with each other may be carried simultaneously in cargo tanks connected to a common vapour pipe;

or

- (b) Insofar as anti-explosion protection is prescribed in column (17) of Table C of Chapter 3.2, a vapour pipe connecting two or more cargo tanks shall be fitted, at the connection to each cargo tank, with a pressure/vacuum valve incorporating a flame arrester capable of withstanding a detonation/deflagration.

Only substances which do not mix and which do not react dangerously with each other may be carried simultaneously in cargo tanks connected to a common vapour pipe;

or

- (c) Insofar as anti-explosion protection is prescribed in column (17) of Table C of Chapter 3.2, an independent vapour pipe for each cargo tank, fitted with a pressure/vacuum valve incorporating a flame arrester capable of withstanding a deflagration and a high-velocity vent valve incorporating a flame arrester capable of withstanding steady burning. Several different substances may be carried simultaneously;

or

- (d) Insofar as anti-explosion protection is prescribed in column (17) of Table C of Chapter 3.2, a vapour pipe connecting two or more cargo tanks shall be fitted, at the connection to each cargo tank, with a shut-off device capable of withstanding a detonation, where each cargo tank is fitted with a vacuum valve capable of withstanding a deflagration and a high-velocity vent valve capable of withstanding steady burning.

Only substances which do not mix and which do not react dangerously with each other may be carried simultaneously in cargo tanks connected to a common vapour pipe.

9.3.3.22.6 9.3.3.22.2, 9.3.3.22.4 (b) and 9.3.3.22.5 do not apply to open type N with flame-arrester and to open type N.

9.3.3.22.3 does not apply to open type N.

9.3.3.23 *Pressure tests*

9.3.3.23.1 The cargo tanks, residual cargo tanks, cofferdams, pipes for loading and unloading, with the exception of discharge hoses shall be subjected to initial tests before being put into service and thereafter at prescribed intervals.

Where a heating system is provided inside the cargo tanks, the heating coils shall be subjected to initial tests before being put into service and thereafter at prescribed intervals.

9.3.3.23.2 The test pressure for the cargo tanks and residual cargo tanks shall be not less than 1.3 times the design pressure. The test pressure for the cofferdams and open cargo tanks shall be not less than 10 kPa (0.10 bar) gauge pressure.

9.3.3.23.3 The test pressure for pipes for loading and unloading shall be not less than 1,000 kPa (10 bar) gauge pressure.

9.3.3.23.4 The maximum intervals for the periodic tests shall be 11 years.

9.3.3.23.5 The procedure for pressure tests shall comply with the provisions established by the competent authority or a recognised classification society.

9.3.3.24 *(Reserved)*

9.3.3.25 *Pumps and piping*

9.3.3.25.1 (a) Pumps and accessory loading and unloading piping shall be located in the cargo area.

(b) Cargo pumps shall be capable of being shut down from the cargo area and from a position outside the cargo area.

(c) Cargo pumps situated on deck shall be located not less than 6.00 m from entrances to, or openings of, the accommodation and service spaces outside the cargo area.

9.3.3.25.2 (a) Pipes for loading and unloading shall be independent of any other piping of the vessel. No cargo piping shall be located below deck, except those inside the cargo tanks and inside the cargo pump-room.

(b) The pipes for loading and unloading shall be arranged so that, after loading or unloading operations, the liquid remaining in these pipes may be safely removed and may flow either into the vessel's cargo tanks or the tanks ashore.

(c) Pipes for loading and unloading shall be clearly distinguishable from other piping, e.g. by means of colour marking.

(d) *(Reserved)*

- (e) The shore connections shall be located not less than 6.00 m from the entrances to, or openings of, the accommodation and service spaces outside the cargo area.
- (f) Each shore connection of the vapour pipe and shore connections of the pipes for loading and unloading, through which the loading or unloading operation is carried out, shall be fitted with a shut-off device. However, each shore connection shall be fitted with a blind flange when it is not in operation.

Each shore connection of the pipes for loading and unloading through which the loading or unloading operation is carried out shall be fitted with the device intended for the discharge of residual cargo described in the model in 8.6.4.1.

NOTE: It is not necessary to apply this paragraph. The date of application will be defined later.

- (g) The vessel shall be equipped with a stripping system.

NOTE: It is not necessary to apply this paragraph. The date of application will be defined later.

- (h) Pipes for loading and unloading, and vapour pipes, shall not have flexible connections fitted with sliding seals when substances with corrosive properties (see column (5) of Table C of Chapter 3.2, hazard 8) are transported.

9.3.3.25.3 The distance referred to in 9.3.3.25.1 (c) and (e) and 9.3.3.25.2 (e) may be reduced to 3.00 m if a transverse bulkhead complying with 9.3.3.10.2 is situated at the end of the cargo area. The openings shall be provided with doors.

The following notice shall be displayed on the doors:

**Do not open during loading and unloading without
the permission of the master.
Close immediately.**

9.3.3.25.4 (a) Every component of the pipes for loading and unloading shall be electrically connected to the hull.

(b) The pipes for loading shall extend down to the bottom of the cargo tanks.

9.3.3.25.5 The stop valves or other shut-off devices of the pipes for loading and unloading shall indicate whether they are open or shut.

9.3.3.25.6 The pipes for loading and unloading shall have, at the test pressure, the required elasticity, leakproofness and resistance to pressure.

9.3.3.25.7 The pipes for loading and unloading shall be fitted with pressure gauges at the outlet of the pumps. The permissible maximum overpressure or vacuum value shall be indicated on each installation. Readings shall be possible in all weather conditions.

9.3.3.25.8 (a) When pipes for loading and unloading are used for supplying the cargo tanks with washing or ballast water, the suctions of these pipes shall be located within the cargo area but outside the cargo tanks.

Pumps for tank washing systems with associated connections may be located outside the cargo area, provided the discharge side of the system is arranged in such a way that suction is not possible through that part.

A spring-loaded non-return valve shall be provided to prevent any gases from being expelled from the cargo area through the tank washing system.

- (b) A non-return valve shall be fitted at the junction between the water suction pipe and the cargo loading pipe.

9.3.3.25.9 The permissible loading and unloading flows shall be calculated. For open type N with flame-arrester and open type N the loading and unloading flows depend on the total cross-section of the exhaust ducts.

Calculations concerning the permissible maximum loading and unloading flows for each cargo tank or each group of cargo tanks, taking into account the design of the ventilation system. These calculations shall take into consideration the fact that in the event of an unforeseen cut-off of the gas return piping or the compensation piping of the shore facility, the safety devices of the cargo tanks will prevent pressure in the cargo tanks from exceeding the following values:

over pressure: 115% of the opening pressure of the high velocity vent valve

vacuum pressure: not more than the construction vacuum pressure but not exceeding 5 kPa (0.05 bar)

The main factors to be considered are the following:

1. Dimensions of the ventilation system of the cargo tanks;
2. Gas formation during loading: multiply the largest loading flow by a factor of not less than 1.25;
3. Density of the vapour mixture of the cargo based on 50% volume vapour of 50% volume air;
4. Loss of pressure through ventilation pipes, valves and fittings. Account will be taken of a 30% clogging of the mesh of the flame-arrester;
5. Chocking pressure of the safety valves.

The permissible maximum loading and unloading pressure for each cargo tank or for each group of cargo tanks shall be given in an on-board instruction.

9.3.3.25.10 The stripping system shall be subjected to initial tests before being put into service or thereafter if any alteration has been made to it, using water as test medium. The test and the determination of the residual quantities shall be carried out in accordance with the requirements of 8.6.4.2.

In this test, the following residual quantities shall not be exceeded:

- (a) 5 l for each cargo tank;
- (b) 15 l for each pipe system.

The residual quantities obtained in the test shall be entered in the certificate in 8.6.4.3.

NOTE: It is not necessary to apply this paragraph. The date of application will be defined later.

9.3.3.25.11 If the vessels is carrying several dangerous substances liable to react dangerously with each other, a separate pump with its own piping for loading and unloading shall be installed for each substance. The piping shall not pass through a cargo tank containing dangerous substances with which the substance in question is liable to react.

9.3.3.25.12 9.3.3.25.1 (a) and (c), 9.3.3.25.2 (a), last sentence and (e), 9.3.3.25.3 and 9.3.3.25.4 (a) do not apply to type N open unless the substance carried has corrosive properties (see column (5) of Table C of Chapter 3.2, hazard 8).

9.3.3.25.4 (b) does not apply to open type N.

9.3.3.25.2 (f), last sentence, 9.3.3.25.2 (g), 9.3.3.25.8 (a), last sentence and 9.3.3.25.10 do not apply to oil separator and supply vessels.

9.3.3.25.9 does not apply to oil separator vessels.

9.3.3.25.2 (h) does not apply to supply vessels.

9.3.3.26 *Residual cargo tanks and slop tanks*

NOTE: It is not necessary to apply this paragraph. The date of application will be defined later.

9.3.3.26.1 The vessel shall be provided with at least one residual cargo tank and with at least one tank for slops. These tanks shall be located only in the cargo area. Intermediate bulk containers or tank-containers or portable tanks in accordance with 7.2.4.1 may be used instead of a fixed residual cargo tank. During filling of intermediate bulk containers or tank-containers or portable tanks, means for collecting any leakage shall be placed under the filling connections.

9.3.3.26.2 Slop tanks shall be fire resistant and shall be capable of being closed with lids (e.g. drums with lever closing ring lids). The tanks shall be marked and easy to handle.

9.3.3.26.3 The maximum permissible capacity of a residual cargo tank is 30 m³.

9.3.3.26.4 The residual cargo tanks shall be equipped with:

- in the case of an open system:
 - a device for ensuring pressure equilibrium;
 - an ullage opening;
 - connections, with stop valves, for pipes and hoses;
- in the case of a protected system:
 - a device for ensuring pressure equilibrium, fitted with a flame-arrester capable of withstanding steady burning;
 - an ullage opening;
 - connections, with stop valves, for pipes and hoses;
- in the case of a closed system:

- a vacuum valve and a high-velocity vent valve.

The high-velocity vent valve shall be so regulated that it does not open during carriage. This condition is met when the opening pressure of the valve meets the conditions required in column (10) of Table C of Chapter 3.2 for the substance to be carried. When anti-explosion protection is required in column (17) of Table C of Chapter 3.2, the vacuum valve shall be capable of withstanding deflagrations and the high-velocity vent valve steady burning;

- a device for measuring the degree of filling;
- connections, with stop valves, for pipes and hoses.

Intermediate bulk containers (IBCs), tank containers and portable tanks intended to collect cargo remains, cargo residues or slops shall be equipped with:

- a connection enabling gases released during filling to be evacuated safely;
- a possibility of indicating the degree of filling;
- connections with shut-off devices, for pipes and hoses.

Residual cargo tanks, intermediate bulk containers (IBCs), tank containers and portable tanks shall be connected to the vapour pipe of cargo tanks only for the time necessary to fill them in accordance with 7.2.4.15.2.

Residual cargo tanks, intermediate bulk containers (IBCs), tank containers and portable tanks placed on the deck shall be located at a minimum distance from the hull equal to one quarter of the vessel's breadth.

9.3.3.26.5 9.3.3.26.1 and 9.3.3.26.3 above do not apply to oil separator vessels.

9.3.3.27 *(Reserved)*

9.3.3.28 *Water-spray system*

When water-spraying is required in column (9) of Table C of Chapter 3.2, a water-spray system shall be installed in the cargo area on deck for the purpose of cooling the tops of cargo tanks by spraying water over the whole surface so as to avoid safely the activation of the high-velocity vent valve at 10 kPa or as regulated.

The spray nozzles shall be so installed that the entire cargo deck area is covered and the gases released are precipitated safely.

The system shall be capable of being put into operation from the wheelhouse and from the deck. Its capacity shall be such that when all the spray nozzles are in operation, the outflow is not less than 50 litres per square metre of deck area and per hour.

9.3.3.29-
9.3.3.30 *(Reserved)*

9.3.3.31 *Engines*

9.3.3.31.1 Only internal combustion engines running on fuel with a flashpoint of more than 55 °C are allowed.

- 9.3.3.31.2 Ventilation inlets of the engine room and, when the engines do not take in air directly from the engine room, air intakes of the engines shall be located not less than 2.00 m from the cargo area.
- 9.3.3.31.3 Sparking shall not be possible within the cargo area.
- 9.3.3.31.4 The surface temperature of the outer parts of engines used during loading or unloading operations, as well as that of their air inlets and exhaust ducts shall not exceed the allowable temperature according to the temperature class of the substances carried. This provision does not apply to engines installed in service spaces provided the provisions of 9.3.3.52.3 are fully complied with.
- 9.3.3.31.5 The ventilation in the closed engine room shall be designed so that, at an ambient temperature of 20 °C, the average temperature in the engine room does not exceed 40 °C.
- 9.3.3.31.6 9.3.3.31.2 above does not apply to oil separator or supply vessels.

9.3.3.32 *Oil fuel tanks*

- 9.3.3.32.1 Where the vessel is provided with hold spaces, the double bottoms within these spaces may be arranged as oil fuel tanks, provided their depth is not less than 0.6 m.

Oil fuel pipes and openings of such tanks are not permitted in the hold space.

- 9.3.3.32.2 The open ends of the air pipes of each oil fuel tank shall extend to 0.5 m above the open deck. These open ends and the open ends of overflow pipes leading to the deck shall be provided with a protective device consisting of a gauze diaphragm or a perforated plate.

9.3.3.33 (*Reserved*)

9.3.3.34 *Exhaust pipes*

- 9.3.3.34.1 Exhaust shall be evacuated from the vessel into the open air either upwards through an exhaust pipe or through the shell plating. The exhaust outlet shall be located not less than 2.00 m from the cargo area. The exhaust pipes of engines shall be arranged so that the exhausts are led away from the vessel. The exhaust pipes shall not be located within the cargo area.

- 9.3.3.34.2 Exhaust pipes shall be provided with a device preventing the escape of sparks, e.g. spark arresters.

- 9.3.3.34.3 The distance prescribed in 9.3.3.34.1 above does not apply to oil separator or supply vessels.

9.3.3.35 *Bilge pumping and ballasting arrangements*

- 9.3.3.35.1 Bilge and ballast pumps for spaces within the cargo area shall be installed within such area.

This provision does not apply to:

- double-hull spaces and double bottoms which do not have a common boundary wall with the cargo tanks;
- cofferdams, double-hull, double bottom and hold spaces where ballasting is carried out using the piping of the fire-fighting system in the cargo area and bilge-pumping is performed using eductors.

- 9.3.3.35.2 Where the double bottom is used as a liquid oil fuel tank, it shall not be connected to the bilge piping system.
- 9.3.3.35.3 Where the ballast pump is installed in the cargo area, the standpipe and its outboard connection for suction of ballast water shall be located within the cargo area but outside the cargo tanks.
- 9.3.3.35.4 A cargo pump-room below deck shall be capable of being drained in an emergency by an installation located in the cargo area and independent from any other installation. The installation shall be provided outside the cargo pump-room.

9.3.3.36-
9.3.3.39 (*Reserved*)

9.3.3.40 *Fire-extinguishing arrangements*

9.3.3.40.1 A fire-extinguishing system shall be installed on the vessel. This system shall comply with the following requirements:

- It shall be supplied by two independent fire or ballast pumps, one of which shall be ready for use at any time. These pumps and their means of propulsion and electrical equipment shall not be installed in the same space.;
- It shall be provided with a water main fitted with at least three hydrants in the cargo area above deck. Three suitable and sufficiently long hoses with spray nozzles having a diameter of not less than 12 mm shall be provided. It shall be possible to reach any point of the deck in the cargo area simultaneously with at least two jets of water which do not emanate from the same hydrant;

A spring-loaded non-return valve shall be fitted to ensure that no gases can escape through the fire-extinguishing system into the accommodation or service spaces outside the cargo area;

- The capacity of the system shall be at least sufficient for a jet of water to have a minimum reach of not less than the vessel's breadth from any location on board with two spray nozzles being used at the same time.

9.3.3.40.2 In addition the engine room, the pump-room and all spaces containing essential equipment (switchboards, compressors, etc.) for the refrigeration equipment, if any, shall be provided with a fixed fire-extinguishing system meeting the following requirements:

9.3.3.40.2.1 *Extinguishing agents*

For the protection of spaces in engine rooms, boiler rooms and pump rooms, only permanently fixed fire-extinguishing systems using the following extinguishing agents are permitted:

- (a) CO₂ (carbon dioxide);
- (b) HFC 227 ea (heptafluoropropane);
- (c) IG-541 (52% nitrogen, 40% argon, 8% carbon dioxide).
- (d) FK-5-1-12 (dodecafluoro 2-methylpentane-3-one).

Other extinguishing agents are permitted only on the basis of recommendations by the Administrative Committee.

9.3.3.40.2.2 *Ventilation, air extraction*

- (a) The combustion air required by the combustion engines which ensure propulsion should not come from spaces protected by permanently fixed fire-extinguishing systems. This requirement is not mandatory if the vessel has two independent main engine rooms with a gastight separation or if, in addition to the main engine room, there is a separate engine room installed with a bow thruster that can independently ensure propulsion in the event of a fire in the main engine room.
- (b) All forced ventilation systems in the space to be protected shall be shut down automatically as soon as the fire-extinguishing system is activated.
- (c) All openings in the space to be protected which permit air to enter or gas to escape shall be fitted with devices enabling them to be closed rapidly. It shall be clear whether they are open or closed.
- (d) Air escaping from the pressure-relief valves of the pressurised air tanks installed in the engine rooms shall be evacuated to the open air.
- (e) Overpressure or negative pressure caused by the diffusion of the extinguishing agent shall not destroy the constituent elements of the space to be protected. It shall be possible to ensure the safe equalisation of pressure.
- (f) Protected spaces shall be provided with a means of extracting the extinguishing agent. If extraction devices are installed, it shall not be possible to start them up during extinguishing.

9.3.3.40.2.3 *Fire alarm system*

The space to be protected shall be monitored by an appropriate fire alarm system. The alarm signal shall be audible in the wheelhouse, the accommodation and the space to be protected.

9.3.3.40.2.4 *Piping system*

- (a) The extinguishing agent shall be routed to and distributed in the space to be protected by means of a permanent piping system. Piping installed in the space to be protected and the reinforcements it incorporates shall be made of steel. This shall not apply to the connecting nozzles of tanks and compensators provided that the materials used have equivalent fire-retardant properties. Piping shall be protected against corrosion both internally and externally.
- (b) The discharge nozzles shall be so arranged as to ensure the regular diffusion of the extinguishing agent. In particular, the extinguishing agent must also be effective beneath the floor.

9.3.3.40.2.5 *Triggering device*

- (a) Automatically activated fire-extinguishing systems are not permitted.
- (b) It shall be possible to activate the fire-extinguishing system from a suitable point located outside the space to be protected.

- (c) Triggering devices shall be so installed that they can be activated in the event of a fire and so that the risk of their breakdown in the event of a fire or an explosion in the space to be protected is reduced as far as possible.

Systems which are not mechanically activated shall be supplied from two energy sources independent of each other. These energy sources shall be located outside the space to be protected. The control lines located in the space to be protected shall be so designed as to remain capable of operating in the event of a fire for a minimum of 30 minutes. The electrical installations are deemed to meet this requirement if they conform to the IEC 60331-21:1999 standard.

When the triggering devices are so placed as not to be visible, the component concealing them shall carry the "Fire-fighting system" symbol, each side being not less than 10 cm in length, with the following text in red letters on a white ground:

Fire-extinguishing system

- (d) If the fire-extinguishing system is intended to protect several spaces, it shall comprise a separate and clearly-marked triggering device for each space.
- (e) The instructions shall be posted alongside all triggering devices and shall be clearly visible and indelible. The instructions shall be in a language the master can read and understand and if this language is not English, French or German, they shall be in English, French or German. They shall include information concerning:
- (i) the activation of the fire-extinguishing system;
 - (ii) the need to ensure that all persons have left the space to be protected;
 - (iii) The correct behaviour of the crew in the event of activation and when accessing the space to be protected following activation or diffusion, in particular in respect of the possible presence of toxic substances;
 - (iv) the correct behaviour of the crew in the event of the failure of the fire-extinguishing system to function properly.
- (f) The instructions shall mention that prior to the activation of the fire-extinguishing system, combustion engines installed in the space and aspirating air from the space to be protected, shall be shut down.

9.3.3.40.2.6 *Alarm device*

- (a) Permanently fixed fire-extinguishing systems shall be fitted with an audible and visual alarm device.
- (b) The alarm device shall be set off automatically as soon as the fire-extinguishing system is first activated. The alarm device shall function for an appropriate period of time before the extinguishing agent is released; it shall not be possible to turn it off;
- (c) Alarm signals shall be clearly visible in the spaces to be protected and their access points and be clearly audible under operating conditions corresponding to the highest possible sound level. It shall be possible to distinguish them clearly from all other sound and visual signals in the space to be protected.

- (d) Sound alarms shall also be clearly audible in adjoining spaces, with the communicating doors shut, and under operating conditions corresponding to the highest possible sound level.
- (e) If the alarm device is not intrinsically protected against short circuits, broken wires and drops in voltage, it shall be possible to monitor its operation.
- (f) A sign with the following text in red letters on a white ground shall be clearly posted at the entrance to any space the extinguishing agent may reach:

Warning, fire-extinguishing system!
Leave this space immediately when the ... (description)
alarm is activated!

9.3.3.40.2.7 *Pressurised tanks, fittings and piping*

- (a) Pressurised tanks, fittings and piping shall conform to the requirements of the competent authority.
- (b) Pressurised tanks shall be installed in accordance with the manufacturer's instructions.
- (c) Pressurised tanks, fittings and piping shall not be installed in the accommodation.
- (d) The temperature of cabinets and storage spaces for pressurised tanks shall not exceed 50 °C.
- (e) Cabinets or storage spaces on deck shall be securely stowed and shall have vents so placed that in the event of a pressurised tank not being gastight, the escaping gas cannot penetrate into the vessel. Direct connections with other spaces are not permitted.

9.3.3.40.2.8 *Quantity of extinguishing agent*

If the quantity of extinguishing agent is intended for more than one space, the quantity of extinguishing agent available does not need to be greater than the quantity required for the largest of the spaces thus protected.

9.3.3.40.2.9 *Installation, maintenance, monitoring and documents*

- (a) The mounting or modification of the system shall only be performed by a company specialised in fire-extinguishing systems. The instructions (product data sheet, safety data sheet) provided by the manufacturer of the extinguishing agent or the system shall be followed.
- (b) The system shall be inspected by an expert:
 - (i) before being brought into service;
 - (ii) each time it is put back into service after activation;
 - (iii) after every modification or repair;
 - (iv) regularly, not less than every two years.
- (c) During the inspection, the expert is required to check that the system conforms to the requirements of 9.3.3.40.2.

- (d) The inspection shall include, as a minimum:
 - (i) an external inspection of the entire system;
 - (ii) an inspection to ensure that the piping is leakproof;
 - (iii) an inspection to ensure that the control and activation systems are in good working order;
 - (iv) an inspection of the pressure and contents of tanks;
 - (v) an inspection to ensure that the means of closing the space to be protected are leakproof;
 - (vi) an inspection of the fire alarm system;
 - (vii) an inspection of the alarm device.
- (e) The person performing the inspection shall establish, sign and date a certificate of inspection.
- (f) The number of permanently fixed fire-extinguishing systems shall be mentioned in the inspection certificate.

9.3.3.40.2.10 *Fire-extinguishing system operating with CO₂*

In addition to the requirements contained in 9.3.3.40.2.1 to 9.3.3.40.2.9, fire-extinguishing systems using CO₂ as an extinguishing agent shall conform to the following provisions:

- (a) Tanks of CO₂ shall be placed in a gastight space or cabinet separated from other spaces. The doors of such storage spaces and cabinets shall open outwards; they shall be capable of being locked and shall carry on the outside the symbol “Warning: danger”, not less than 5 cm high and “CO₂” in the same colours and the same size;
- (b) Storage cabinets or spaces for CO₂ tanks located below deck shall only be accessible from the outside. These spaces shall have an artificial ventilation system with extractor hoods and shall be completely independent of the other ventilation systems on board;
- (c) The level of filling of CO₂ tanks shall not exceed 0.75 kg/l. The volume of depressurised CO₂ shall be taken to be 0.56 m³/kg;
- (d) The concentration of CO₂ in the space to be protected shall be not less than 40% of the gross volume of the space. This quantity shall be released within 120 seconds. It shall be possible to monitor whether diffusion is proceeding correctly;
- (e) The opening of the tank valves and the control of the diffusing valve shall correspond to two different operations;
- (f) The appropriate period of time mentioned in 9.3.3.40.2.6 (b) shall be not less than 20 seconds. A reliable installation shall ensure the timing of the diffusion of CO₂.

9.3.3.40.2.11 *Fire-extinguishing system operating with HFC-227 ea (heptafluoropropane)*

In addition to the requirements of 9.3.0.40.2.1 to 9.3.0.40.2.9, fire-extinguishing systems using HFC-227 ea as an extinguishing agent shall conform to the following provisions:

- (a) Where there are several spaces with different gross volumes, each space shall be equipped with its own fire-extinguishing system;
- (b) Every tank containing HFC-227 ea placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of the tank are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;
- (c) Every tank shall be fitted with a device permitting control of the gas pressure;
- (d) The level of filling of tanks shall not exceed 1.15 kg/l. The specific volume of depressurised HFC-227 ea shall be taken to be 0.1374 m³/kg;
- (e) The concentration of HFC-227 ea in the space to be protected shall be not less than 8% of the gross volume of the space. This quantity shall be released within 10 seconds;
- (f) Tanks of HFC-227 ea shall be fitted with a pressure monitoring device which triggers an audible and visual alarm in the wheelhouse in the event of an unscheduled loss of propellant gas. Where there is no wheelhouse, the alarm shall be triggered outside the space to be protected;
- (g) After discharge, the concentration in the space to be protected shall not exceed 10.5% (volume);
- (h) The fire-extinguishing system shall not comprise aluminium parts.

9.3.3.40.2.12 *Fire-extinguishing system operating with IG-541*

In addition to the requirements of 9.3.3.40.2.1 to 9.3.3.40.2.9, fire-extinguishing systems using IG-541 as an extinguishing agent shall conform to the following provisions:

- (a) Where there are several spaces with different gross volumes, every space shall be equipped with its own fire-extinguishing system;
- (b) Every tank containing IG-541 placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of the tank are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;
- (c) Each tank shall be fitted with a device for checking the contents;
- (d) The filling pressure of the tanks shall not exceed 200 bar at a temperature of +15 °C;
- (e) The concentration of IG-541 in the space to be protected shall be not less than 44% and not more than 50% of the gross volume of the space. This quantity shall be released within 120 seconds.

9.3.3.40.2.13 *Fire-extinguishing system operating with FK-5-1-12*

In addition to the requirements of 9.3.3.40.2.1 to 9.3.3.40.2.9, fire-extinguishing systems using FK-5-1-12 as an extinguishing agent shall comply with the following provisions:

- (a) Where there are several spaces with different gross volumes, every space shall be equipped with its own fire-extinguishing system;
- (b) Every tank containing FK-5-1-12 placed in the space to be protected shall be fitted with a device to prevent overpressure. This device shall ensure that the contents of the tank are safely diffused in the space to be protected if the tank is subjected to fire, when the fire-extinguishing system has not been brought into service;
- (c) Every tank shall be fitted with a device permitting control of the gas pressure;
- (d) The level of filling of tanks shall not exceed 1.00 kg/l. The specific volume of depressurized FK-5-1-12 shall be taken to be 0.0719 m³/kg;
- (e) The volume of FK-5-1-12 in the space to be protected shall be not less than 5.5% of the gross volume of the space. This quantity shall be released within 10 seconds;
- (f) Tanks of FK-5-1-12 shall be fitted with a pressure monitoring device which triggers an audible and visual alarm in the wheelhouse in the event of an unscheduled loss of extinguishing agent. Where there is no wheelhouse, the alarm shall be triggered outside the space to be protected;
- (g) After discharge, the concentration in the space to be protected shall not exceed 10.0%.

9.3.3.40.2.14 *Fixed fire-extinguishing system for physical protection*

In order to ensure physical protection in the engine rooms, boiler rooms and pump rooms, permanently fixed fire-extinguishing systems are accepted solely on the basis of recommendations by the Administrative Committee.

9.3.3.40.3 The two hand fire-extinguishers referred to in 8.1.4 shall be located in the cargo area.

9.3.3.40.4 The fire-extinguishing agent and the quantity contained in the permanently fixed fire-extinguishing system shall be suitable and sufficient for fighting fires.

9.3.3.40.5 9.3.3.40 and 9.3.3.40.2 above do not apply to oil separator or supply vessels.

9.3.3.41 *Fire and naked light*

9.3.3.41.1 The outlets of funnels shall be located not less than 2.00 m from the cargo area. Arrangements shall be provided to prevent the escape of sparks and the entry of water.

9.3.3.41.2 Heating, cooking and refrigerating appliances shall not be fuelled with liquid fuels, liquid gas or solid fuels.

The installation in the engine room or in another separate space of heating appliances fuelled with liquid fuel having a flashpoint above 55 °C is, however, permitted.

Cooking and refrigerating appliances are permitted only in the accommodation.

9.3.3.41.3 Only electrical lighting appliances are permitted.

9.3.3.42 *Cargo heating system*

9.3.3.42.1 Boilers which are used for heating the cargo shall be fuelled with a liquid fuel having a flashpoint of more than 55 °C. They shall be placed either in the engine room or in another separate space below deck and outside the cargo area, which is accessible from the deck or from the engine room.

9.3.3.42.2 The cargo heating system shall be designed so that the cargo cannot penetrate into the boiler in the case of a leak in the heating coils. A cargo heating system with artificial draught shall be ignited electrically.

9.3.3.42.3 The ventilation system of the engine room shall be designed taking into account the air required for the boiler.

9.3.3.42.4 Where the cargo heating system is used during loading, unloading or gas-freeing, the service space which contains this system shall fully comply with the requirements of 9.3.3.52.3. This requirement does not apply to the inlets of the ventilation system. These inlets shall be located at a minimum distance of 2 m from the cargo area and 6 m from the openings of cargo tanks or residual cargo tanks, loading pumps situated on deck, openings of high-velocity vent valves, pressure relief devices and shore connections of loading and unloading pipes and must be located not less than 2 m above the deck.

The requirements of 9.3.3.52.3 are not applicable to the unloading of substances having a flashpoint of 60 °C or more when the temperature of the product is at least 15 K lower at the flashpoint.

9.3.3.43-
9.3.3.49 (*Reserved*)

9.3.3.50 *Documents concerning electrical installations*

9.3.3.50.1 In addition to the documents required in accordance with the Regulations referred to in 1.1.4.6, the following documents shall be on board:

- (a) a drawing indicating the boundaries of the cargo area and the location of the electrical equipment installed in this area;
- (b) a list of the electrical equipment referred to in (a) above including the following particulars:

machine or appliance, location, type of protection, type of protection against explosion, testing body and approval number;
- (c) a list of or general plan indicating the electrical equipment outside the cargo area which may be operated during loading, unloading or gas-freeing. All other electrical equipment shall be marked in red. See 9.3.3.52.3 and 9.3.3.52.4.

9.3.3.50.2 The documents listed above shall bear the stamp of the competent authority issuing the certificate of approval.

9.3.3.51 *Electrical installations*

9.3.3.51.1 Only distribution systems without return connection to the hull are permitted.

This provision does not apply to:

- active cathodic corrosion protection;
- certain limited sections of the installations situated outside the cargo area (e.g. connections of starters of diesel engines);
- the device for checking the insulation level referred to in 9.3.3.51.2 below.

9.3.3.51.2 Every insulated distribution network shall be fitted with an automatic device with a visual and audible alarm for checking the insulation level.

9.3.3.51.3 For the selection of electrical equipment to be used in zones presenting an explosion risk, the explosion groups and temperature classes assigned to the substances carried in columns (15) and (16) of Table C of Chapter 3.2 shall be taken into consideration.

9.3.3.52 *Type and location of electrical equipment*

9.3.3.52.1 (a) Only the following equipment may be installed in cargo tanks, residual cargo tanks, and pipes for loading and unloading (comparable to zone 0):

- measuring, regulation and alarm devices of the EEx (ia) type of protection.

(b) Only the following equipment may be installed in the cofferdams, double-hull spaces, double bottoms and hold spaces (comparable to zone 1):

- measuring, regulation and alarm devices of the certified safe type;
- lighting appliances of the “flame-proof enclosure” or “apparatus protected by pressurization” type of protection;
- hermetically sealed echo sounding devices the cables of which are led through thick-walled steel tubes with gastight connections up to the main deck;
- cables for the active cathodic protection of the shell plating in protective steel tubes such as those provided for echo sounding devices.

(c) Only the following equipment may be installed in the service spaces in the cargo area below deck (comparable to zone 1):

- measuring, regulation and alarm devices of the certified safe type;
- lighting appliances of the “flame-proof enclosure” or “apparatus protected by pressurization” type of protection;
- motors driving essential equipment such as ballast pumps; they shall be of the certified safe type.

(d) The control and protective equipment of the electrical equipment referred to in paragraphs (a), (b) and (c) above shall be located outside the cargo area if they are not intrinsically safe.

(e) The electrical equipment in the cargo area on deck (comparable to zone 1) shall be of the certified safe type.

9.3.3.52.2 Accumulators shall be located outside the cargo area.

- 9.3.3.52.3 (a) Electrical equipment used during loading, unloading and gas-freeing during berthing and which are located outside the cargo area shall (comparable to zone 2) be at least of the “limited explosion risk” type.
- (b) This provision does not apply to:
- (i) lighting installations in the accommodation, except for switches near entrances to accommodation;
 - (ii) radiotelephone installations in the accommodation or the wheelhouse;
 - (iii) mobile and fixed telephone installations in the accommodation or the wheelhouse;
 - (iv) electrical installations in the accommodation, the wheelhouse or the service spaces outside the cargo areas if:
 1. These spaces are fitted with a ventilation system ensuring an overpressure of 0.1 kPa (0.001 bar) and none of the windows is capable of being opened; the air intakes of the ventilation system shall be located as far away as possible, however, not less than 6.00 m from the cargo area and not less than 2.00 m above the deck;
 2. The spaces are fitted with a gas detection system with sensors:
 - at the suction inlets of the ventilation system;
 - directly at the top edge of the sill of the entrance doors of the accommodation and service spaces;
 3. The gas concentration measurement is continuous;
 4. When the gas concentration reaches 20% of the lower explosive limit, the ventilators are switched off. In such a case and when the overpressure is not maintained or in the event of failure of the gas detection system, the electrical installations which do not comply with (a) above, shall be switched off. These operations shall be performed immediately and automatically and activate the emergency lighting in the accommodation, the wheelhouse and the service spaces, which shall comply at least with the “limited explosion risk” type. The switching-off shall be indicated in the accommodation and wheelhouse by visual and audible signals;
 5. The ventilation system, the gas detection system and the alarm of the switch-off device fully comply with the requirements of (a) above;
 6. The automatic switch-off device is set so that no automatic switching-off may occur while the vessel is under way.
- 9.3.3.52.4 The electrical equipment which does not meet the requirements set out in 9.3.3.52.3 above together with its switches shall be marked in red. The disconnection of such equipment shall be operated from a centralised location on board.
- 9.3.3.52.5 An electric generator which is permanently driven by an engine and which does not meet the requirements of 9.3.3.52.3 above, shall be fitted with a switch capable of shutting down the excitation of the generator. A notice board with the operating instructions shall be displayed near the switch.

9.3.3.52.6 Sockets for the connection of signal lights and gangway lighting shall be permanently fitted to the vessel close to the signal mast or the gangway. Connecting and disconnecting shall not be possible except when the sockets are not live.

9.3.3.52.7 The failure of the power supply for the safety and control equipment shall be immediately indicated by visual and audible signals at the locations where the alarms are usually actuated.

9.3.3.53 *Earthing*

9.3.3.53.1 The metal parts of electrical appliances in the cargo area which are not live as well as protective metal tubes or metal sheaths of cables in normal service shall be earthed, unless they are so arranged that they are automatically earthed by bonding to the metal structure of the vessel.

9.3.3.53.2 The provisions of 9.3.3.53.1 above apply also to equipment having service voltages of less than 50 V.

9.3.3.53.3 Independent cargo tanks shall be earthed.

9.3.3.53.4 Metal intermediate bulk containers (IBCs) and tank-containers, used as residual cargo tanks or slop tanks, shall be capable of being earthed.

9.3.3.54-
9.3.3.55 (*Reserved*)

9.3.3.56 *Electrical cables*

9.3.3.56.1 All cables in the cargo area shall have a metallic sheath.

9.3.3.56.2 Cables and sockets in the cargo area shall be protected against mechanical damage.

9.3.3.56.3 Movable cables are prohibited in the cargo area, except for intrinsically safe electric circuits or for the supply of signal lights, gangway lighting and submerged pumps on board oil separator vessels.

9.3.3.56.4 Cables of intrinsically safe circuits shall only be used for such circuits and shall be separated from other cables not intended for being used in such circuits (e.g. they shall not be installed together in the same string of cables and they shall not be fixed by the same cable clamps).

9.3.3.56.5 For movable cables intended for signal lights, gangway lighting, and submerged pumps on board oil separator vessels, only sheathed cables of type H 07 RN-F in accordance with IEC publication-60 245-4 (1994) or cables of at least equivalent design having conductors with a cross-section of not less than 1.5 mm² shall be used.

These cables shall be as short as possible and installed so that damage is not likely to occur.

9.3.3.56.6 The cables required for the electrical equipment referred to in 9.3.3.52.1 (b) and (c) are accepted in cofferdams, double-hull spaces, double bottoms, hold spaces and service spaces below deck. When the vessel is only authorized to carry substances for which no anti-explosion protection is required in column (17) of Table C in Chapter 3.2, cable penetration is permitted in the hold spaces.

9.3.3.57-
9.3.3.59 (*Reserved*)

9.3.3.60 *Special equipment*

A shower and an eye and face bath shall be provided on the vessel at a location which is directly accessible from the cargo area.

This requirement does not apply to oil separator and supply vessels.

9.3.3.61-
9.3.3.70 (*Reserved*)

9.3.3.71 *Admittance on board*

The notice boards displaying the prohibition of admittance in accordance with 8.3.3 shall be clearly legible from either side of the vessel.

9.3.3.72-
9.3.3.73 (*Reserved*)

9.3.3.74 *Prohibition of smoking, fire or naked light*

9.3.3.74.1 The notice boards displaying the prohibition of smoking in accordance with 8.3.4 shall be clearly legible from either side of the vessel.

9.3.3.74.2 Notice boards indicating the circumstances under which the prohibition is applicable shall be fitted near the entrances to the spaces where smoking or the use of fire or naked light is not always prohibited.

9.3.3.74.3 Ashtrays shall be provided close to each exit in the accommodation and the wheelhouse.

9.3.3.75-
9.3.3.91 (*Reserved*)

9.3.3.92 On board of tank vessels referred to in 9.3.3.11.7, spaces the entrances or exits of which are likely to become partly or completely immersed in the damaged condition shall have an emergency exit which is situated not less than 0.10 m above the damage waterline. This requirement does not apply to forepeak and afterpeak.

9.3.3.93-
9.3.3.99 (*Reserved*)

9.3.4 **Alternative constructions****9.3.4.1** *General*

9.3.4.1.1 The maximum permissible capacity of a cargo tank in accordance with 9.3.1.11.1, 9.3.2.11.1 and 9.3.3.11.1 may be exceeded and the minimum distances in accordance with 9.3.1.11.2 a) and 9.3.2.11.7 may be deviated from provided that the provisions of this section are complied with. The capacity of a cargo tank shall not exceed 1000 m³.

9.3.4.1.2 Tank vessels whose cargo tanks exceed the maximum allowable capacity or where the distance between the side wall and the cargo tank is smaller than required, shall be protected through a more crashworthy side structure. This shall be proved by comparing the risk of a conventional construction (reference construction), complying with the ADN regulations with the risk of a crashworthy construction (alternative construction).

9.3.4.1.3 When the risk of the more crashworthy construction is equal to or lower than the risk of the conventional construction, equivalent or higher safety is proven. The equivalent or higher safety shall be proven in accordance with 9.3.4.3.

9.3.4.1.4 When a vessel is built in compliance with this section, a recognised classification society shall document the application of the calculation procedure in accordance with 9.3.4.3 and shall submit its conclusions to the competent authority for approval.

The competent authority may request additional calculations and proof.

9.3.4.1.5 The competent authority shall include this construction in the certificate of approval in accordance with 8.6.1.

9.3.4.2 *Approach*

9.3.4.2.1 The probability of cargo tank rupture due to a collision and the area around the vessel affected by the cargo outflow as a result thereof are the governing parameters. The risk is described by the following formula:

$$R = P \cdot C$$

Wherein: R risk [m^2],

P probability of cargo tank rupture [],

C consequence (measure of damage) of cargo tank rupture [m^2].

9.3.4.2.2 The probability P of cargo tank rupture depends on the probability distribution of the available collision energy represented by vessels, which the victim is likely to encounter in a collision, and the capability of the struck vessel to absorb collision energy without cargo tank rupture. A decrease of this probability can be achieved by means of a more crashworthy side structure.

The consequence C of cargo spillage resulting from cargo tank rupture is expressed as an affected area around the struck vessel.

9.3.4.2.3 The procedure according to 9.3.4.3 shows how tank rupture probabilities shall be calculated as well as how the collision energy absorbing capacity of side structure and a consequence increase shall be determined.

9.3.4.3 *Calculation procedure*

9.3.4.3.1 The calculation procedure shall follow 13 basic steps. Steps 2 through 10 shall be carried out for both the alternative design and the reference design. The following table shows the calculation of the weighted probability of cargo tank rupture:

9.3.4.3.1.1 *Step 1*

Besides the alternative design, which is used for cargo tanks exceeding the maximum allowable capacity or a reduced distance between the side wall and the cargo tank as well as a more crashworthy side structure, a reference design with at least the same dimensions (length, width, depth, displacement) shall be drawn up. This reference design shall fulfil the requirements specified in section 9.3.1 (Type G), 9.3.2 (Type C) or 9.3.3. (Type N) and shall comply with the minimum requirements of a recognised classification society.

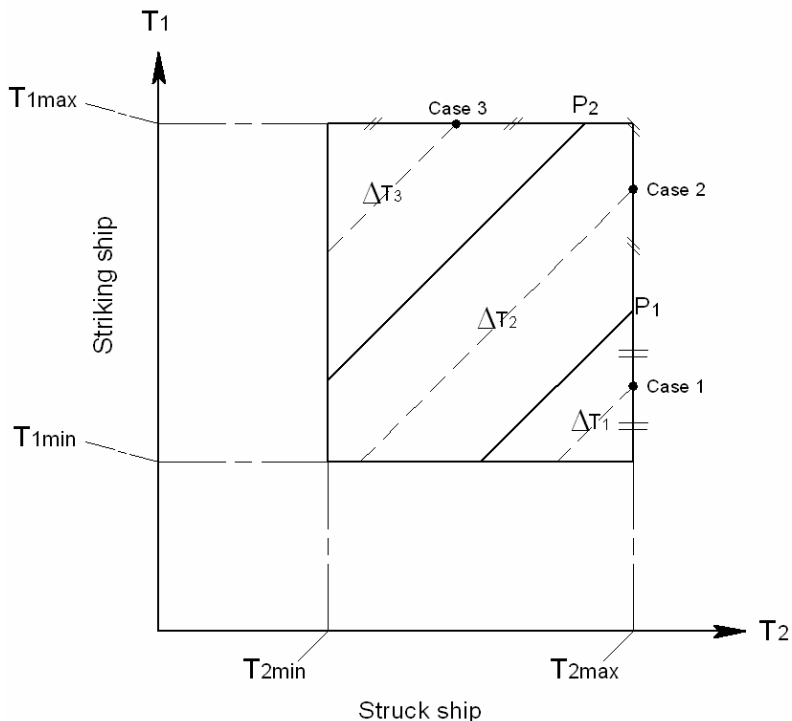
9.3.4.3.1.2 *Step 2*

9.3.4.3.1.2.1 The relevant typical collision locations $i=1$ through n shall be determined. The table in 9.3.4.3.1 depicts the general case where there are 'n' typical collision locations.

The number of typical collision locations depends on the vessel design. The choice of the collision locations shall be accepted by the recognised classification society.

9.3.4.3.1.2.2 *Vertical collision locations*9.3.4.3.1.2.2.1 *Tank vessel type C and N*

9.3.4.3.1.2.2.1.1 The determination of the collision locations in the vertical direction depends on the draught differences between striking and struck vessel, which is limited by the maximum and minimum draughts of both vessels and the construction of the struck vessel. This can be depicted graphically through a rectangular area which is enclosed by the values of the maximum and minimum draught of both striking and struck vessel (see following figure).

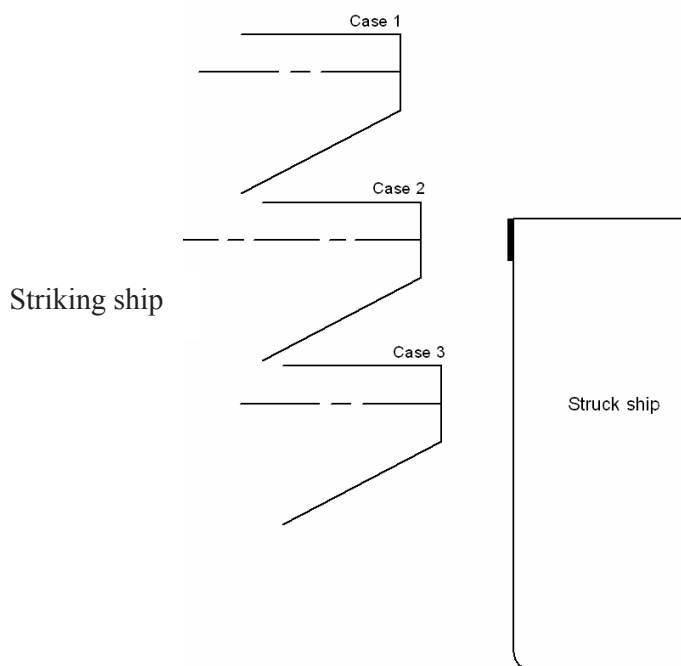


Definition of vertical striking locations

9.3.4.3.1.2.2.1.2 Each point in this area represents a possible draught combination. T_{1max} is the maximum draught and T_{1min} is the minimum draught of the striking vessel, while T_{2max} and T_{2min} are

the corresponding minimum and maximum draughts of the struck vessel. Each draught combination has an equal probability of occurrence.

- 9.3.4.3.1.2.2.1.3 Points on each inclined line in the figure in 9.3.4.3.1.2.2.1.1 indicate the same draught difference. Each of these lines reflects a vertical collision location. In the example in the figure in 9.3.4.3.1.2.2.1.1 three vertical collision locations are defined, depicted by three areas. Point P_1 is the point where the lower edge of the vertical part of the push barge or V-bow strikes at deck level of the struck vessel. The triangular area for collision case 1 is bordered by point P_1 . This corresponds to the vertical collision location “collision at deck level”. The triangular upper left area of the rectangle corresponds to the vertical collision location “collision below deck”. The draught difference ΔT_i , $i=1,2,3$ shall be used in the collision calculations (see following figure).



Example of vertical collision locations

- 9.3.4.3.1.2.2.1.4 For the calculation of the collision energies the maximum masses of both striking vessel and struck vessel must be used (highest point on each respective diagonal ΔT_i).
- 9.3.4.3.1.2.2.1.5 Depending on the vessel design, the recognised classification society may require additional collision locations.
- 9.3.4.3.1.2.2.2 *Tank vessel type G*
- For a tank vessel type G a collision at half tank height shall be assumed. The recognised classification society may require additional collision locations at other heights. This shall be agreed with the recognised classification society.
- 9.3.4.3.1.2.3 *Longitudinal collision location*
- 9.3.4.3.1.2.3.1 *Tank vessels type C and N*

At least the following three typical collision locations shall be considered:

- at bulkhead,

- between webs and
- at web.

9.3.4.3.1.2.3.1 *Tank vessel Type G*

For a tank vessel type G at least the following three typical collision locations shall be considered:

- at cargo tank end,
- between webs and
- at web.

9.3.4.3.1.2.4 *Number of collision locations*

9.3.4.3.1.2.4.1 *Tank vessel type C and N*

The combination of vertical and longitudinal collision locations in the example mentioned in 9.3.4.3.1.2.1.3 and 9.3.4.3.1.2.3.1 results in $3 \cdot 3 = 9$ collision locations.

9.3.4.3.1.2.4.2 *Tank vessel type G*

The combination of vertical and longitudinal collision locations in the example mentioned in 9.3.4.3.1.2.2.2 and 9.3.4.3.1.2.3.2 results in $1 \cdot 3 = 3$ collision locations.

9.3.4.3.1.2.4.3 *Additional examinations for tank vessels type G, C and N with independent cargo tanks*

As proof that the tank seatings and the buoyancy restraints do not cause any premature tank rupture, additional calculations shall be carried out. The additional collision locations for this purpose shall be agreed with the recognised classification society.

9.3.4.3.1.3 *Step 3*

9.3.4.3.1.3.1 For each typical collision location a weighting factor which indicates the relative probability that such a typical collision location will be struck shall be determined. In the table in 9.3.4.3.1 these factors are named $wf_{loc(i)}$ (column J). The assumptions shall be agreed with the recognised classification society.

The weighting factor for each collision location is the product of the factor for the vertical collision location by the factor for the longitudinal collision location.

9.3.4.3.1.3.2 *Vertical collision locations*

9.3.4.3.1.3.2.1 *Tank vessel type C and N*

The weighting factors for the various vertical collision locations are in each case defined by the ratio between the partial area for the corresponding collision case and the total area of the rectangle shown in the Figure in 9.3.4.3.1.2.2.1.1.

For example, for collision case 1 (see figure in 9.3.4.3.1.2.2.1.3) the weighting factor equals the ratio between the triangular lower right area of the rectangle, and the area of the rectangle between minimum and maximum draughts of striking and struck vessels.

9.3.4.3.1.3.2.2 *Tank vessel type G*

The weighting factor for the vertical collision location has the value 1.0, if only one collision location is assumed. When the recognised classification society requires additional collision locations, the weighting factor shall be determined analogous to the procedure for tank vessels type C and N.

9.3.4.3.1.3.3 *Longitudinal collision locations*

9.3.4.3.1.3.3.1 *Tank vessel type C and N*

The weighting factor for each longitudinal collision location is the ratio between the “calculational span length” and the tank length.

The calculational span length shall be calculated as follows:

(a) collision on bulkhead:

0.2 • distance between web frame and bulkhead, but not larger than 450 mm,

(b) collision on web frame:

sum of 0.2 • web frame spacing forward of the web frame, but not larger than 450 mm, and 0.2 • web frame spacing aft of the web frame, but not larger than 450 mm, and

(c) collision between web frames:

cargo tank length minus the length “collision at bulkhead” and minus the length “collision at web frame”.

9.3.4.3.1.3.3.2 *Tank vessel type G*

The weighting factor for each longitudinal collision location is the ratio between the “calculational span length” and the length of the hold space.

The calculational span length shall be calculated as follows:

(a) collision at cargo tank end:

distance between bulkhead and the start of the cylindrical part of the cargo tank,

(b) collision on web frame:

sum of 0.2 • web frame spacing forward of the web frame, but not larger than 450 mm, and 0.2 • web frame spacing aft of the web frame, but not larger than 450 mm, and

(c) collision between web frames:

cargo tank length minus the length “collision at cargo tank end” and minus the length “collision at web frame”.

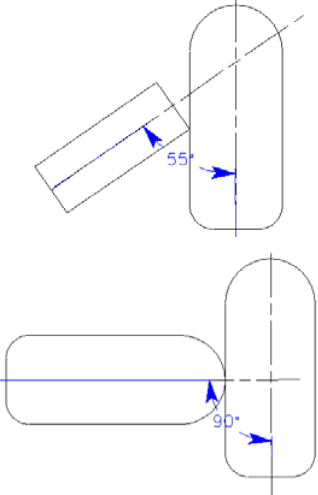
9.3.4.3.1.4 *Step 4*

9.3.4.3.1.4.1 For each collision location the collision energy absorbing capacity shall be calculated. For that matter the collision energy absorbing capacity is the amount of collision energy absorbed by the vessel structure up to initial rupture of the cargo tank (see the table in 9.3.4.3.1, column D: $E_{loc(i)}$). For this purpose a finite element analysis in accordance with 9.3.4.4.2 shall be used.

9.3.4.3.1.4.2 These calculations shall be done for two collision scenarios according to the following table. Collision scenario I shall be analysed under the assumption of a push barge bow shape. Collision scenario II shall be analysed under the assumption of a V-shaped bow.

These bow shapes are defined in 9.3.4.4.8.

Table : Speed reduction factors for scenario I or scenario II with weighting factors

Worst case scenarios				Causes		
				Communication error and poor visibility	Technical error	Human error
				0,50	0,20	0,30
I	0,80	0,66	0,50	1,00		
		0,30			1,00	
II	0,20	0,30			1,00	

9.3.4.3.1.5 Step 5

9.3.4.3.1.5.1 For each collision energy absorption capacity $E_{loc(i)}$, the associated probability of exceedance is to be calculated, i.e. the probability of cargo tank rupture. For this purpose, the formula for the cumulative probability density functions (CPDF) below shall be used. The appropriate coefficients shall be selected from the Table in 9.3.4.3.1.5.6 for the effective mass of the struck vessel.

$$P_{x\%} = C_1(E_{loc(i)})^3 + C_2(E_{loc(i)})^2 + C_3E_{loc(i)} + C_4$$

with: $P_{x\%}$ probability of tank rupture,
 C_{1-4} coefficients from table in 9.3.4.3.1.5.6,
 $E_{loc(i)}$ collision energy absorbing capacity.

9.3.4.3.1.5.2 The effective mass shall be equal to the maximum displacement of the vessel multiplied by a factor of 1.4. Both collision scenarios (9.3.4.3.1.4.2) shall be considered.

9.3.4.3.1.5.3 In the case of collision scenario I (push barge bow at 55°), three CPDF formulas shall be used:

CPDF 50% (velocity 0.5 V_{max}),
 CPDF 66% (velocity 2/3 V_{max}) and
 CPDF 100% (velocity V_{max}).

9.3.4.3.1.5.4 In the case of scenario II (V-shaped bow at 90°), the following two CPDF formulas shall be used:

CPDF 30% (velocity 0.3 V_{max}) and
 CPDF 100% (velocity V_{max}).

9.3.4.3.1.5.5 In the table in 9.3.4.3.1, column F, these probabilities are called $P50\%$, $P66\%$, $P100\%$ and $P30\%$, $P100\%$ respectively.

9.3.4.3.1.5.6 Table: Coefficients for the CPDF formulas

Effective mass of struck vessel in tonnes	velocity = 1 x V_{max}				
	coefficients				
	C_1	C_2	C_3	C_4	range
14000	4.106E-05	-2.507E-03	9.727E-03	9.983E-01	$4 < E_{loc} < 39$
12000	4.609E-05	-2.761E-03	1.215E-02	9.926E-01	$4 < E_{loc} < 36$
10000	5.327E-05	-3.125E-03	1.569E-02	9.839E-01	$4 < E_{loc} < 33$
8000	6.458E-05	-3.691E-03	2.108E-02	9.715E-01	$4 < E_{loc} < 31$
6000	7.902E-05	-4.431E-03	2.719E-02	9.590E-01	$4 < E_{loc} < 27$
4500	8.823E-05	-5.152E-03	3.285E-02	9.482E-01	$4 < E_{loc} < 24$
3000	2.144E-05	-4.607E-03	2.921E-02	9.555E-01	$2 < E_{loc} < 19$
1500	-2.071E-03	2.704E-02	-1.245E-01	1.169E+00	$2 < E_{loc} < 12$

Effective mass of struck vessel in tonnes	velocity = 0.66 x V_{max}				
	coefficients				
	C_1	C_2	C_3	C_4	range
14000	4.638E-04	-1.254E-02	2.041E-02	1.000E+00	$2 < E_{loc} < 17$
12000	5.377E-04	-1.427E-02	2.897E-02	9.908E-01	$2 < E_{loc} < 17$
10000	6.262E-04	-1.631E-02	3.849E-02	9.805E-01	$2 < E_{loc} < 15$
8000	7.363E-04	-1.861E-02	4.646E-02	9.729E-01	$2 < E_{loc} < 13$
6000	9.115E-04	-2.269E-02	6.285E-02	9.573E-01	$2 < E_{loc} < 12$
4500	1.071E-03	-2.705E-02	7.738E-02	9.455E-01	$1 < E_{loc} < 11$
3000	-1.709E-05	-1.952E-02	5.123E-02	9.682E-01	$1 < E_{loc} < 8$
1500	-2.479E-02	1.500E-01	-3.218E-01	1.204E+00	$1 < E_{loc} < 5$

Effective mass of struck vessel in tonnes	velocity = 0.5 x V_{max}				
	coefficients				
	C_1	C_2	C_3	C_4	range
14000	2.621E-03	-3.978E-02	3.363E-02	1.000E+00	$1 < E_{loc} < 10$
12000	2.947E-03	-4.404E-02	4.759E-02	9.932E-01	$1 < E_{loc} < 9$
10000	3.317E-03	-4.873E-02	5.843E-02	9.878E-01	$2 < E_{loc} < 8$
8000	3.963E-03	-5.723E-02	7.945E-02	9.739E-01	$2 < E_{loc} < 7$
6000	5.349E-03	-7.407E-02	1.186E-01	9.517E-01	$1 < E_{loc} < 6$
4500	6.303E-03	-8.713E-02	1.393E-01	9.440E-01	$1 < E_{loc} < 6$
3000	2.628E-03	-8.504E-02	1.447E-01	9.408E-01	$1 < E_{loc} < 5$
1500	-1.566E-01	5.419E-01	-6.348E-01	1.209E+00	$1 < E_{loc} < 3$

Effective mass of struck vessel in tonnes	velocity = 0.3 x V _{max}				
	coefficients				
	C ₁	C ₂	C ₃	C ₄	range
14000	5.628E-02	-3.081E-01	1.036E-01	9.991E-01	1 < E _{loc} < 3
12000	5.997E-02	-3.212E-01	1.029E-01	1.002E+00	1 < E _{loc} < 3
10000	7.477E-02	-3.949E-01	1.875E-01	9.816E-01	1 < E _{loc} < 3
8000	1.021E-02	-5.143E-01	2.983E-01	9.593E-01	1 < E _{loc} < 2
6000	9.145E-02	-4.814E-01	2.421E-01	9.694E-01	1 < E _{loc} < 2
4500	1.180E-01	-6.267E-01	3.542E-01	9.521E-01	1 < E _{loc} < 2
3000	7.902E-02	-7.546E-01	5.079E-01	9.218E-01	1 < E _{loc} < 2
1500	-1.031E+00	2.214E-01	1.891E-01	9.554E-01	0.5 < E _{loc} < 1

The range where the formula is valid is given in column 6. In case of an E_{loc} value below the range the probability equals P_{x%} = 1.0. In case of a value above the range P_{x%} equals 0.

9.3.4.3.1.6 Step 6

The weighted probabilities of cargo tank rupture P_{wx%} (table in 9.3.4.3.1, column H) shall be calculated by multiplying each cargo tank rupture probability P_{x%} (table in 9.3.4.3.1, column F) by the weighting factors wf_{x%} according to the following table:

Table: Weighting factors for each characteristic collision speed

			weighting factor
Scenario I	CPDF 50%	wf50%	0.2
	CPDF 66%	wf66%	0.5
	CPDF 100%	wf100%	0.3
Scenario II	CPDF 30%	wf30%	0.7
	CPDF 100%	wf100%	0.3

9.3.4.3.1.7 Step 7

The total probabilities of cargo tank rupture P_{loc(i)} (table in 9.3.4.3.1, column I) resulting from 9.3.4.3.1.6 (step 6) shall be calculated as the sum of all weighted cargo tank rupture probabilities P_{wx%} (table in 9.3.4.3.1, column H) for each collision location considered.

9.3.4.3.1.8 Step 8

For both collision scenarios the weighted total probabilities of cargo tank rupture P_{wloc(i)} shall, in each case, be calculated by multiplying the total tank probabilities of cargo tank rupture P_{loc(i)} for each collision location, by the weighting factors wf_{loc(i)} corresponding to the respective collision location (see 9.3.4.3.1.3 (step 3) and table in 9.3.4.3.1, column J).

9.3.4.3.1.9 Step 9

Through the addition of the weighted total probabilities of cargo tank rupture P_{wloc(i)}, the scenario specific total probabilities of cargo tank rupture P_{scenI} and P_{scenII} (table in 9.3.4.3.1, column L) shall be calculated, for each collision scenario I and II separately.

9.3.4.3.1.10 Step 10

Finally the weighted value of the overall total probability of cargo tank rupture P_w shall be calculated by the formula below (table in 9.3.4.3.1, column O):

$$P_w = 0.8 \cdot P_{\text{scenI}} + 0.2 \cdot P_{\text{scenII}}$$

9.3.4.3.1.11 *Step 11*

The overall total probability of cargo tank rupture P_w for the alternative design is called P_n .
The overall total probability of cargo tank rupture P_w for the reference design is called P_r .

9.3.4.3.1.12 *Step 12*

- 9.3.4.3.1.12.1 The ratio (C_n/C_r) between the consequence (measure of damage) C_n of a cargo tank rupture of the alternative design and the consequence C_r of a cargo tank rupture of the reference design shall be determined with the following formula:

$$C_n/C_r = V_n / V_r$$

With C_n/C_r the ratio between the consequence related to the alternative design, and the consequence related to the reference design,

V_n maximum capacity of the largest cargo tank in the alternative design,

V_r maximum capacity of the largest cargo tank reference design.

- 9.3.4.3.1.12.2 This formula was derived for characteristic cargoes as listed in the following table.

Table: Characteristic cargoes

	UN	Description
Benzene	1114	Flammable liquid Packing group II Hazardous to health
Acrylonitrile Stabilised ACN	1093	Flammable liquid Packing group I Toxic, stabilised
n-Hexane	1208	Flammable liquid Packing group II
Nonane	1920	Flammable liquid Packing group III
Ammonia	1005	Toxic, corrosive gas Liquefied under pressure
Propane	1978	Flammable gas Liquefied under pressure

- 9.3.4.3.1.12.3 For cargo tanks with capacities between 380 m³ and 1000 m³ containing flammable, toxic and acid liquids or gases it shall be assumed that the effect increase relates linearly to the increased tank capacity (proportionality factor 1.0).

- 9.3.4.3.1.12.4 If substances are to be carried in tank vessels, which have been analysed according to this calculation procedure, where the proportionality factor between the total cargo tank capacity and the affected area is expected to be larger than 1.0, as assumed in the previous paragraph, the affected area shall be determined through a separate calculation. In this case the comparison as described in 9.3.4.3.1.13 (step 13) shall be carried out with this different value for the size of the affected area, t.

9.3.4.3.1.13 *Step 13*

Finally the ratio $\frac{P_r}{P_n}$ between the overall total probability of cargo tank rupture P_r for the reference design and the overall total probability of cargo tank rupture P_n for the alternative

design shall be compared with the ratio $\frac{C_n}{C_r}$ between the consequence related to the alternative design, and the consequence related to the reference design.

When $\frac{C_n}{C_r} \leq \frac{P_r}{P_n}$ is fulfilled, the evidence according to 9.3.4.1.3 for the alternative design is provided.

9.3.4.4 Determination of the collision energy absorbing capacity

9.3.4.4.1 General

9.3.4.4.1.1 The determination of the collision energy absorbing capacity shall be carried out by means of a Finite Element Analysis (FEA). The analysis shall be carried out using a customary finite element code (e.g. LS-DYNA², PAM-CRASH³, ABAQUS⁴ etc.) capable of dealing with both geometrical and material non-linear effects. The code shall also be able to simulate rupture realistically.

9.3.4.4.1.2 The program actually used and the level of detail of the calculations shall be agreed upon with a recognised classification society.

9.3.4.4.2 Creating the finite element models (FE models)

9.3.4.4.2.1 First of all, FE models for the more crashworthy design and one for the reference design shall be generated. Each FE model shall describe all plastic deformations relevant for all collision cases considered. The section of the cargo area to be modelled shall be agreed upon with a recognised classification society.

9.3.4.4.2.2 At both ends of the section to be modelled all three translational degrees of freedom are to be restrained. Because in most collision cases the global horizontal hull girder bending of the vessel is not of significant relevance for the evaluation of plastic deformation energy it is sufficient that only half beam of the vessel needs to be considered. In these cases the transverse displacements at the centre line (CL) shall be constrained. After generating the FE model, a trial collision calculation shall be carried out to ensure that there is no occurrence of plastic deformations near the constraint boundaries. Otherwise the FE modelled area has to be extended.

9.3.4.4.2.3 Structural areas affected during collisions shall be sufficiently finely idealized, while other parts may be modelled more coarsely. The fineness of the element mesh shall be suitable for an adequate description of local folding deformations and for determination of realistic rupture of elements.

9.3.4.4.2.4 The calculation of rupture initiation must be based on fracture criteria which are suitable for the elements used. The maximum element size shall be less than 200 mm in the collision areas. The ratio between the longer and the shorter shell element edge shall not exceed the value of three. The element length L for a shell element is defined as the longer length of both sides of the element. The ratio between element length and element thickness shall be larger than five. Other values shall be agreed upon with the recognised classification society.

² LSTC, 7374 Las Positas Rd, Livermore, CA 94551, USA Tel : +1 925 245-4500.

³ ESI Group, 8, Rue Christophe Colomb, 75008 Paris, France
Tel: +33 (0)1 53 65 14 14, Fax: +33 (0)1 53 65 14 12, E-mail: info@esi-group.com.

⁴ SIMULIA, Rising Sun Mills, 166 Valley Street, Providence, RI 02909-2499 USA
Tel: +1 401 276-4400, Fax: +1 401 276-4408, E-mail: info@simulia.com.

9.3.4.4.2.5 Plate structures, such as shell, inner hull (tank shell in the case of gas tanks), webs as well as stringers can be modelled as shell elements and stiffeners as beam elements. While modelling, cut outs and manholes in collision areas shall be taken into account.

9.3.4.4.2.6 In the FE calculation the 'node on segment penalty' method shall be used for the contact option. For this purpose the following options shall be activated in the codes mentioned:

- “contact_automatic_single_surface” in LS-DYNA,
- “self impacting” in PAMCRASH, and
- similar contact types in other FE-programs.

9.3.4.4.3 *Material properties*

9.3.4.4.3.1 Because of the extreme behaviour of material and structure during a collision, with both geometrical and material non-linear effects, true stress-strain relations shall be used:

$$\sigma = C \cdot \varepsilon^n,$$

where

$$n = \ln(1 + A_g),$$

$$C = R_m \cdot \left(\frac{e}{n}\right)^n,$$

A_g = the maximum uniform strain related to the ultimate tensile stress R_m and
 e = the natural logarithmic constant.

9.3.4.4.3.2 The values A_g and R_m shall be determined through tensile tests.

9.3.4.4.3.3 If only the ultimate tensile stress R_m is available, for shipbuilding steel with a yield stress R_{eH} of not more than 355 N/mm² the following approximation shall be used in order to obtain the A_g value from a known R_m [N/mm²] value:

$$A_g = \frac{1}{0.24 + 0.01395 \cdot R_m}$$

9.3.4.4.3.4 If the material properties from tensile tests are not available when starting the calculations, minimum values of A_g and R_m , as defined in the rules of the recognised classification society, shall be used instead. For shipbuilding steel with a yield stress higher than 355 N/mm² or materials other than shipbuilding steel, material properties shall be agreed upon with a recognised classification society.

9.3.4.4.4 *Rupture criteria*

9.3.4.4.4.1 The first rupture of an element in a FEA is defined by the failure strain value. If the calculated strain, such as plastic effective strain, principal strain or, for shell elements, the strain in the thickness direction of this element exceeds its defined failure strain value, the element shall be deleted from the FE model and the deformation energy in this element will no longer change in the following calculation steps.

9.3.4.4.4.2 The following formula shall be used for the calculation of rupture strain:

$$\varepsilon_f(l_e) = \varepsilon_g + \varepsilon_e \cdot \frac{t}{l_e}$$

where

ε_g = uniform strain

ε_e = necking

t = plate thickness

l_e = individual element length.

9.3.4.4.4.3 The values of uniform strain and the necking for shipbuilding steel with a yield stress R_{eH} of not more than 355 N/mm² shall be taken from the following table:

Table

stress states	1-D	2-D
ε_g	0.079	0.056
ε_e	0.76	0.54
element type	truss beam	shell plate

9.3.4.4.4.4 Other ε_g and ε_e values taken from thickness measurements of exemplary damage cases and experiments may be used in agreement with the recognised classification society.

9.3.4.4.4.5 Other rupture criteria may be accepted by the recognised classification society if proof from adequate tests is provided.

9.3.4.4.4.6 *Tank vessel type G*

For a tank vessel type G the rupture criterion for the pressure tank shall be based on equivalent plastic strain. The value to be used while applying the rupture criterion shall be agreed upon with the recognised classification society. Equivalent plastic strains associated with compressions shall be ignored.

9.3.4.4.5 *Calculation of the collision energy absorbing capacity*

9.3.4.4.5.1 The collision energy absorbing capacity is the summation of internal energy (energy associated with deformation of structural elements) and friction energy.

The friction coefficient μ_c is defined as:

$$\mu_c = FD + (FS - FD) \cdot e^{-DC|v_{rel}|}$$

with FD = 0.1,

FS = 0.3,

DC = 0.01

$|v_{rel}|$ = relative friction velocity.

NOTE: Values are default for shipbuilding steel.

9.3.4.4.5.2 The force penetration curves resulting from the FE model calculation shall be submitted to the recognised classification society.

9.3.4.4.5.3 *Tank vessel type G*

9.3.4.4.5.3.1 In order to obtain the total energy absorbing capacity of a tank vessel type G the energy absorbed through compression of the vapour during the collision shall be calculated.

9.3.4.4.5.3.2 The energy E absorbed by the vapour shall be calculated as follows:

$$E = \frac{p_1 \cdot V_1 - p_0 \cdot V_0}{1 - \gamma}$$

with:

γ 1.4

(Note: The value 1.4 is the default value c_p/c_v with, in principle:

c_p = specific heat at constant pressure [J/(kgK)]

c_v = specific heat at constant volume [J/(kgK)]

p_0 pressure at start of compression [Pa]

p_1 pressure at end of compression [Pa]

V_0 volume at start of compression [m³]

V_1 volume at end of compression [m³]

9.3.4.4.6 *Definition of striking vessel and striking bow*

9.3.4.4.6.1 At least two types of bow shapes of the striking vessel shall be used for calculating the collision energy absorbing capacities:

- bow shape I: push barge bow (see 9.3.4.4.8),
- bow shape II: V-shape bow without bulb (see 9.3.4.4.8).

9.3.4.4.6.2 Because in most collision cases the bow of the striking vessel shows only slight deformations compared to the side structure of the struck vessel, a striking bow will be defined as rigid. Only for special situations, where the struck vessel has an extremely strong side structure compared to the striking bow and the structural behaviour of the struck vessel is influenced by the plastic deformation of the striking bow, the striking bow shall be considered as deformable. In this case the structure of the striking bow should also be modelled. This shall be agreed upon with the recognised classification society.

9.3.4.4.7 *Assumptions for collision cases*

For the collision cases the following shall be assumed:

- (a) As collision angle between striking and struck vessel 90° shall be taken in case of a V-shaped bow and 55° in case of a push barge bow; and
- (b) The struck vessel has zero speed, while the striking vessel runs into the side of the struck ship with a constant speed of 10 m/s.

The collision velocity of 10 m/s is an assumed value to be used in the FE analysis.

9.3.4.4.8 *Types of bow shapes*

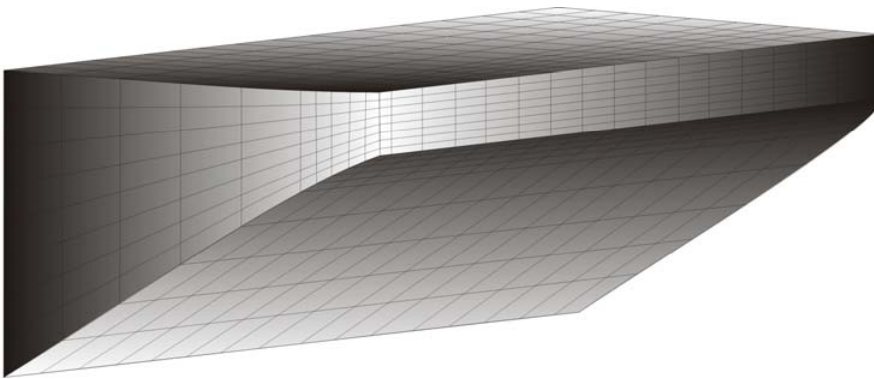
9.3.4.4.8.1 Push barge bow

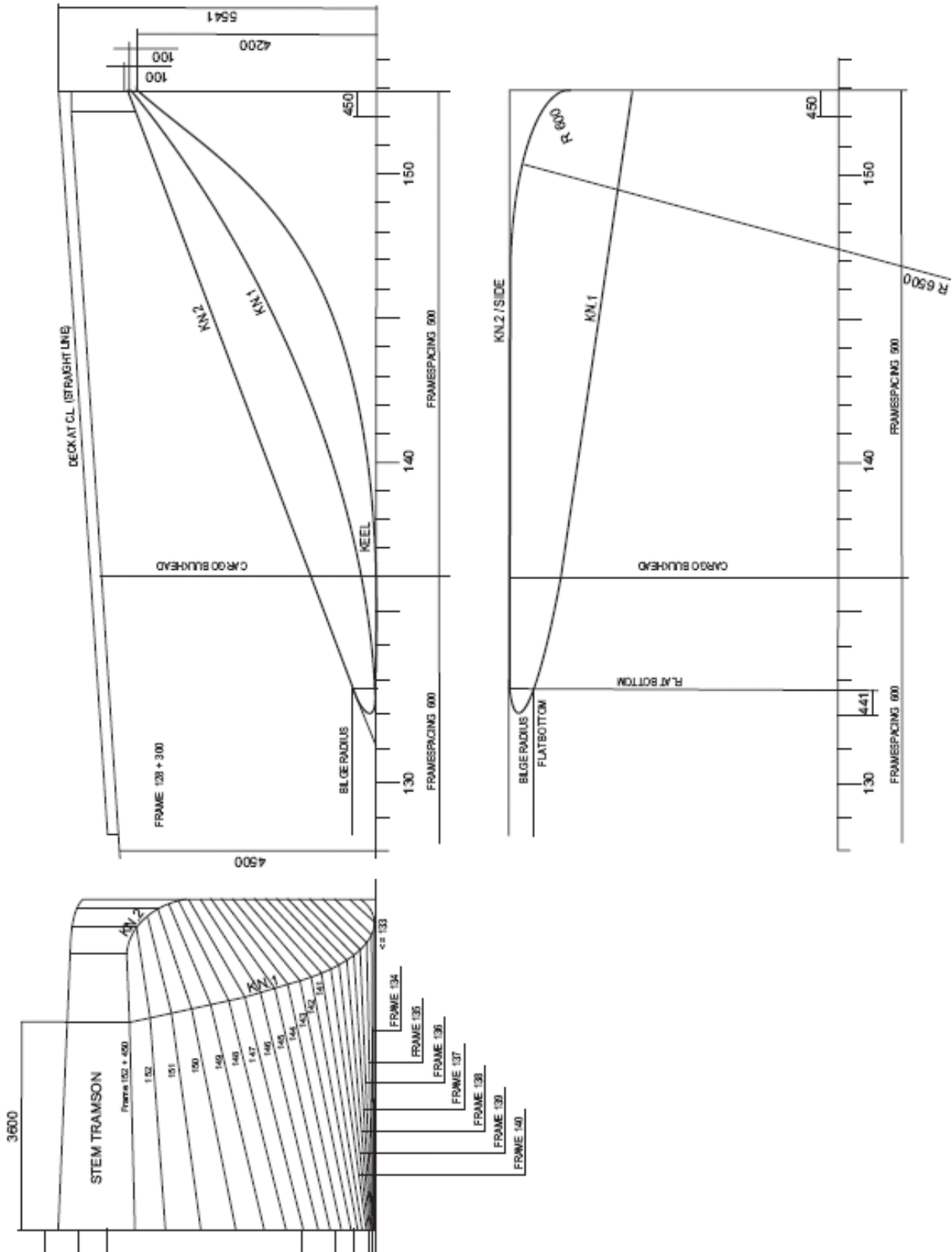
Characteristic dimensions shall be taken from the table below:

fr	half breadths		
	Knuckle 1	Knuckle 2	deck
145	4.173	5.730	5.730
146	4.100	5.730	5.730
147	4.028	5.730	5.730
148	3.955	5.711	5.711
149	3.883	5.653	5.653
150	3.810	5.555	5.555
151	3.738	5.415	5.415
152	3.665	5.230	5.230
transom	3.600	4.642	4.642

stem	heights		
	Knuckle 1	Knuckle 2	deck
0.769	1.773	2.882	5.084
0.993	2.022	3.074	5.116
1.255	2.289	3.266	5.149
1.559	2.576	3.449	5.181
1.932	2.883	3.621	5.214
2.435	3.212	3.797	5.246
3.043	3.536	3.987	5.278
3.652	3.939	4.185	5.315
4.200	4.300	4.351	5.340

The following figures are intended to provide illustration.





9.3.4.4.8.2 V-bow

Characteristic dimensions shall be taken from the table below:

Reference number	x	y	z
1	0.000	3.923	4.459
2	0.000	3.923	4.852
11	0.000	3.000	2.596
12	0.652	3.000	3.507
13	1.296	3.000	4.535
14	1.296	3.000	4.910
21	0.000	2.000	0.947
22	1.197	2.000	2.498
23	2.346	2.000	4.589
24	2.346	2.000	4.955
31	0.000	1.000	0.085
32	0.420	1.000	0.255
33	0.777	1.000	0.509
34	1.894	1.000	1.997
35	3.123	1.000	4.624
36	3.123	1.000	4.986
41	1.765	0.053	0.424
42	2.131	0.120	1.005
43	2.471	0.272	1.997
44	2.618	0.357	2.493
45	2.895	0.588	3.503
46	3.159	0.949	4.629
47	3.159	0.949	4.991
51	0.000	0.000	0.000
52	0.795	0.000	0.000
53	2.212	0.000	1.005
54	3.481	0.000	4.651
55	3.485	0.000	5.004

The following figures are intended to provide illustration.

