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Amendments

to the International Maritime Dangerous Goods (IMDG) Code of the International Convention for the Safety of Life at Sea

For Adoption dates – see page 3

[For entry into force dates - see page 3]

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by the Secretary of State for Foreign, Commonwealth and Development Affairs
by Command of His Majesty
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AMENDMENTS TO THE INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG) CODE OF THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA

The Resolutions were adopted on:

Resolution MSC.501(105), adopted on 28 April 2022
Resolution MSC.477(102), adopted on 11 November 2020
Resolution MSC.442(99), adopted on 24 May 2018
Resolution MSC.406(96), adopted on 13 May 2016
Resolution MSC.372(93), adopted on 22 May 2014
Resolution MSC.328(90), adopted on 26 May 2012
Resolution MSC.262(84), adopted on 16 May 2008
Resolution MSC.205(81), adopted on 18 May 2006
Resolution MSC.157(78), adopted on 20 May 2004
Resolution MSC.122(75), adopted on 24 May 2002

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Resolution MSC.501(105) – 1 January 2024
Resolution MSC.477(102) – 1 June 2022
Resolution MSC.442(99) – 1 January 2020
Resolution MSC.406(96) – 1 January 2018
Resolution MSC.372(93) – 1 January 2016
Resolution MSC.328(90) – 1 January 2014
Resolution MSC.262(84) – 1 January 2010
Resolution MSC.205(81) – 1 January 2008
Resolution MSC.157(78) – 1 January 2006
Resolution MSC.122(75) – 1 January 2004

ANNEX 8

RESOLUTION MSC.372(93)
(adopted on 22 May 2014)

AMENDMENTS TO THE INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG) CODE

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.122(75) by which it adopted the International Maritime Dangerous Goods Code (hereinafter referred to as "the IMDG Code"), which has become mandatory under chapter VII of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended (hereinafter referred to as "the Convention"),

NOTING ALSO article VIII(b) and regulation VII/1.1 of the Convention concerning amendment procedure for amending the IMDG Code,

HAVING CONSIDERED, at its ninety-third session, amendments to the IMDG Code, proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1 ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the IMDG Code, the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on 1 July 2015, unless prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3 INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2016 upon their acceptance in accordance with paragraph 2 above;

4 AGREES that Contracting Governments to the Convention may apply the aforementioned amendments in whole or in part on a voluntary basis as from 1 January 2015;

5 REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

6 ALSO REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization, which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG) CODE

Table of Contents

Insert a new section as "7.1.5 Stowage Codes".

Insert a new section as "7.1.6 Handling Codes".

Insert a new section as "7.2.8 Segregation Codes".

PART 1
GENERAL PROVISIONS, DEFINITIONS AND TRAINING

Chapter 1.1– General provisions

1.1.1 Application and implementation of the Code

1.1.1.9 Insert a new paragraph 1.1.1.9 to read as follows:

"1.1.1.9 ***Lamps containing dangerous goods***

The following lamps are not subject to this Code provided that they do not contain radioactive material and do not contain mercury in quantities above those specified in special provision 366 of chapter 3.3:

.1 Lamps that are collected directly from individuals and households when transported to a collection or recycling facility;

.2 Lamps each containing not more than 1 g of dangerous goods and packaged so that there is not more than 30 g of dangerous goods per package, provided that:

(i) the lamps are manufactured according to a certified quality management system;

Note: The application of ISO 9001:2008 may be considered acceptable for this purpose.

and

(ii) each lamp is either individually packed in inner packagings, separated by dividers, or surrounded with cushioning material to protect the lamps and packed into strong outer packagings meeting the general provisions of 4.1.1.1 and capable of passing a 1.2 m drop test.

.3 Used, damaged or defective lamps each containing not more than 1 g of dangerous goods with not more than 30 g of dangerous goods per package when transported from a collection or recycling facility. The lamps shall be packed in strong outer packagings sufficient for preventing release of the contents under normal conditions of transport meeting the general provisions of 4.1.1.1 and that are capable of passing a drop test of not less than 1.2 m.

Note: lamps containing gases of class 2.2. are addressed in 2.2.2.6.4 and lamps containing radioactive material are addressed in 2.7.2.2.2.2.

.4 Lamps containing only gases of class 2.2 (according to 2.2.2.2) provided they are packaged so that the projectile effects of any rupture of the bulb will be contained within the package."

1.1.2 Conventions

1.1.2.3 International Convention for Safe Containers, 1972, as amended

1.1.2.3 Insert a new 1.1.2.3 with the following:

"1.1.2.3 International Convention for Safe Containers, 1972, as amended

1.1.2.3.1 Regulations 1 and 2 of Annex I to the International Convention for Safe Containers (CSC), 1972, as amended, deal with safety approval plates and maintenance and examination of containers, and are reproduced in full.

Annex I
Regulations for the testing, inspection, approval and maintenance of containers

Chapter I
Regulations common to all systems of approval

Regulation 1
Safety Approval Plate

1 (a) A Safety Approval Plate conforming to the specifications set out in the appendix to this annex shall be permanently affixed to every approved container at a readily visible place, adjacent to any other approval plate issued for official purposes, where it would not be easily damaged.

(b) On each container, all maximum operating gross mass markings shall be consistent with the maximum operating gross mass information on the Safety Approval Plate.

(c) The owner of the container shall remove the Safety Approval Plate on the container if:

(i) the container has been modified in a manner which would void the original approval and the information found on the Safety Approval Plate, or

(ii) the container is removed from service and is not being maintained in accordance with the Convention, or

(iii) the approval has been withdrawn by the Administration.

2 (a) The plate shall contain the following information in at least the English or French language:

CSC SAFETY APPROVAL

Country of approval and approval reference

Date (month and year) of manufacture

Manufacturer's identification number of the container or, in the case of existing containers for which that number is unknown, the number allotted by the Administration

Maximum operating gross mass (kg and lb)

Allowable stacking load for 1.8*g* (kg and lb)

Transverse racking test force (newtons).

(b) A blank space should be reserved on the plate for insertion of end-wall and/or side-wall strength values (factors) in accordance with paragraph 3 of this regulation and annex II, tests 6 and 7. A blank space should also be reserved on the plate for the first and subsequent maintenance examination dates (month and year) when used.

3 Where the Administration considers that a new container satisfies the requirements of the present Convention in respect of safety and if, for such container, the end-wall and/or side-wall strength values (factors) are designed to be greater or less than those stipulated in annex II, such values shall be indicated on the Safety Approval Plate. Where the stacking or racking values are less than 192,000 kg or 150 kN, respectively, the container shall be considered as having limited stacking or racking capacity and shall be conspicuously marked, as required under the relevant standards*, at or before their next scheduled examination or before any other date approved by the Administration, provided this is not later than 1 July 2015.

4 The presence of the Safety Approval Plate does not remove the necessity of displaying such labels or other information as may be required by other regulations which may be in force.

5 A container, the construction of which was completed prior to 1 July 2014, may retain the Safety Approval Plate as permitted by the Convention prior to that date as long as no structural modifications occur to that container.

Regulation 2
Maintenance and examination

1 The owner of the container shall be responsible for maintaining it in safe condition.

2 (a) The owner of an approved container shall examine the container or have it examined in accordance with the procedure either prescribed or approved by the Contracting Party concerned, at intervals appropriate to operating conditions.

(b) The date (month and year) before which a new container shall undergo its first examination shall be marked on the Safety Approval Plate.

(c) The date (month and year) before which the container shall be re-examined shall be clearly marked on the container on or as close as practicable to the Safety Approval Plate and in a manner acceptable to that Contracting Party which prescribed or approved the particular examination procedure involved.

(d) The interval from the date of manufacture to the date of the first examination shall not exceed five years. Subsequent examination of new containers and re-examination of existing containers shall be at intervals of not more than 30 months. All examinations shall determine whether the container has any defects which could place any person in danger.

3 (a) As an alternative to paragraph 2, the Contracting Party concerned may approve a continuous examination programme if satisfied, on evidence submitted by the owner, that such a programme provides a standard of safety not inferior to the one set out in paragraph 2 above.

(b) To indicate that the container is operated under an approved continuous examination programme, a mark showing the letters ACEP and the identification of the Contracting Party which has granted approval of the programme shall be displayed on the container on or as close as practicable to the Safety Approval Plate.

(c) All examinations performed under such a programme shall determine whether a container has any defects

which could place any person in danger. They shall be performed in connection with a major repair, refurbishment, or on-hire/off-hire interchange and in no case less than once every 30 months.

4 As a minimum approved programmes should be reviewed once every 10 years to ensure their continued viability. In order to ensure uniformity by all involved in the inspection of containers and their ongoing operational safety, the Contracting Party concerned shall ensure the following elements are covered in each prescribed periodic or approved continuous examination programme:

(a) methods, scope and criteria to be used during examinations;

(b) frequency of examinations;

(c) qualifications of personnel to carry out examinations;

(d) system of keeping records and documents that will capture:

(i) the owner's unique serial number of the container;

(ii) the date on which the examination was carried out;

(iii) identification of the competent person who carried out the examination;

(iv) the name and location of the organization where the examination was carried out;

(v) the results of the examination; and

(vi) in the case of a periodic examination scheme (PES), the next examination date (NED);

(e) a system for recording and updating the identification numbers of all containers covered by the appropriate examination scheme;

(f) methods and systems for maintenance criteria that addresses the design characteristics of the specific containers;

(g) provisions for maintaining leased containers if different than those used for owned containers; and

(h) conditions and procedures for adding containers into an already approved programme.

5 The Contracting Party shall carry out periodic audits of approved programmes to ensure compliance with the provisions approved by the Contracting Party. The Contracting Party shall withdraw any approval when the conditions of approval are no longer complied with.

6 For the purpose of this regulation, the Contracting Party concerned is the Contracting Party of the territory in which the owner is domiciled or has his head office. However, in the event that the owner is domiciled or has his head office in a country the government of which has not yet made arrangements for prescribing or approving an examination scheme and until such time as the arrangements have been made, the owner may use the procedure prescribed or approved by the Administration of a Contracting Party which is prepared to act as the Contracting Party concerned. The owner shall comply with the conditions for the use of such procedures set by the Administration in question.

7 Administrations shall make information on approved continuous examination programmes publicly available."

Chapter 1.2 – Definitions, units of measurement and abbreviations

1.2.1 Definitions

In all the definitions, whenever the term "for the transport of Class 7 material" is used, replace it with "for the transport of radioactive material".

Amend the following definitions as indicated:

Design: in the first sentence, insert "fissile material excepted under 2.7.3.5.6 after "the description of".

Exclusive use: replace "and unloading is carried" with "and unloading and shipment are carried" and insert ", where so required by the provisions of this Code;" after "consignee".

Freight container: replace the last two sentences with the following:

"In addition: Small freight container means a freight container that has an internal volume of not more than 3 m^3. Large freight container means a freight container that has an internal volume of more than 3 m^3.".

GHS: in the reference for GHS, replace Rev.4 with "Rev.5"

Manual of Test and Criteria, add at the end "and Amend.2".

Multiple-element gas container: replace "and bundles" with "or bundles".

Radiation level: amend the end of the definition to read: "millisieverts per hour or microsieverts per hour;".

Add the following new definitions in alphabetical order:

"*Large salvage packaging* means a special packaging which:

.1 is designed for mechanical handling; and

.2 exceeds 400 kg net mass or 450 litres capacity but has a volume of not more than 3 m³;

into which damaged, defective or leaking dangerous goods packages, or dangerous goods that have spilled or leaked are placed for purposes of transport for recovery or disposal;"

"*Management system*, for the transport of radioactive material, means a set of interrelated or interacting elements (system) for establishing policies and objectives and enabling the objectives to be achieved in an efficient and effective manner;"

"*Neutron radiation detector* is a device that detects neutron radiation. In such a device, a gas may be contained in a hermetically sealed electron tube transducer that converts neutron radiation into a measureable electric signal;"

"*Radiation detection system* is an apparatus that contains radiation detectors as components;".

Chapter 1.5 – General provisions concerning class 7

Replace the title with "GENERAL PROVISIONS CONCERNING RADIOACTIVE MATERIAL".

1.5.1 Scope and application

1.5.1.1 Amend the second and third sentences to read:

"These provisions are based on the IAEA "Regulations for the Safe Transport of Radioactive material, 2012 Edition, IAEA Safety Standards Series No. SSR–6, IAEA, Vienna (2012)". Explanatory material can be found in "Advisory material for the IAEA Regulations for the Safe Transport of Radioactive Material, IAEA Safety Standards Series No. TS-G-1.1 (Rev.2), IAEA, Vienna (2012)"."

1.5.1.2 In the second sentence of the last paragraph replace "imposing requirements" with "imposing conditions".

1.5.1.4 Amend the first sentence to read: "The provisions of this code do not apply to any of the following:" and insert a new subparagraph .4 to read as follows:

".4 Radioactive material in or on a person who is to be transported for medical treatment because the person has been subject to accidental or deliberate intake of radioactive material or to contamination;".

and renumber current subparagraphs .4 to .6 accordingly:

and replace new subparagraph .6 (former .5) with the following:

".6 Natural material and ores containing naturally occurring radionuclides (which may have been processed), provided the activity concentration of the material does not exceed 10 times the values specified in table 2.7.2.2.1, or calculated in accordance with 2.7.2.2.2.1 and 2.7.2.2.3 to 2.7.2.2.6. For natural materials and ores containing naturally occurring radionuclides that are not in secular equilibrium the calculation of the activity concentration shall be performed in accordance with 2.7.2.2.4;".

1.5.1.5 Specific provisions for the transport of excepted packages

1.5.1.5.1 Amend to read as follows:

"1.5.1.5.1 Excepted packages which may contain radioactive material in limited quantities, instruments, manufactured articles or empty packagings as specified in 2.7.2.4.1 shall be subject only to the following provisions of parts 5 to 7:

.1 The applicable provisions specified in 5.1.1.2, 5.1.2, 5.1.3.2, 5.1.5.2.2, 5.1.5.4, 5.2.1.7, 7.1.4.5.9, 7.1.4.5.10, 7.1.4.5.12, 7.8.4.1 to 7.8.4.6 and 7.8.9.1; and

.2 The requirements for excepted packages specified in 6.4.4,

except when the radioactive material possesses other hazardous properties and has to be classified in a class other than Class 7 in accordance with special provision 290 or 369 of Chapter 3.3, where the provisions listed in .1 and .2 above apply only as relevant and in addition to those relating to the main class or division."

1.5.1.5.2 Insert a new second sentence to read as follows:

"If the excepted package contains fissile material, one of the fissile exceptions provided by 2.7.2.3.5 shall apply and the requirements of 5.1.5.5 shall be met."

1.5.2 Radiation protection programme

1.5.2.4 Amend the end of the introductory sentence to read "that the effective dose either:" and insert "or" at the end of subparagraph .1.

1.5.3 Quality assurance

1.5.3 Amend to read as follows:

"1.5.3 Management system

1.5.3.1 A management system based on international, national or other standards acceptable to the competent authority shall be established and implemented for all activities within the scope of this Code, as identified in 1.5.1.3, to ensure compliance with the relevant provisions of this Code. Certification that the design specification has been fully implemented shall be available to the competent authority. The manufacturer, consignor or user shall be prepared:

.1 to provide facilities for inspection during manufacture and use; and

.2 to demonstrate compliance with this Code to the competent authority.

Where competent authority approval is required, such approval shall take into account and be contingent upon the adequacy of the management system."

1.5.4 Special arrangement

1.5.4.2 Replace "Class 7" with "radioactive material", twice.

1.5.6 Non-compliance

1.5.6.1 In the introductory sentence, delete "a" before "non-compliance". In .1 amend the introductory sentence to read:

> "The consignor, consignee, carrier and any organization involved during transport who may be affected, as appropriate, shall be informed of the non-compliance:"

and in .2(iv), delete "and" at the end of the sentence.

PART 2
CLASSIFICATION

Chapter 2.0 – Introduction

2.0.1 Classes, divisions, packing groups

2.0.1.2 Marine pollutants

2.0.1.2.1 Amend paragraph 2.0.1.2.1 to read as follows:

> "Many of the substances assigned to classes 1 to 6.2, 8 and 9 are deemed as being *marine pollutants* (see chapter 2.10)."

2.0.1.3 Add the following new paragraph at the end:

> "Articles are not assigned to packing groups. For packing purposes any requirement for a specific packaging performance level is set out in the applicable packing instruction.".

2.0.3 Classification of substances, mixtures and solutions with multiple hazards (precedence of hazard characteristics)

2.0.3.5 Amend the last sentence to read as follows:

> "For radioactive material in excepted packages, except for UN 3507, URANIUM HEXAFLUORIDE, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE, special provision 290 of Chapter 3.3 applies."

Chapter 2.1 – Class 1 – Explosives

2.1.0 Introductory notes (these notes are not mandatory)

Amend Note 2 in 2.1.3.5.5 to read as follows:

> "**Note 2**: "Flash composition" in this table refers to pyrotechnic substances in powder form or as pyrotechnic units as presented in the firework that are used to produce an aural effect or used as a bursting charge, or propellant charge unless the time taken for the pressure rise is demonstrated to be more than 6 ms for 0.5 g of pyrotechnic substance in the HSL Flash Composition Test in appendix 7 of the Manual of Tests and Criteria."

Chapter 2. 2 – Class 2 – Gases

2.2.1 Definitions and general provisions

2.2.1.2 Add a new indent .5 to read as follows:

".5 *Adsorbed gas* – a gas which when packaged for transport is adsorbed onto a solid porous material resulting in an internal receptacle pressure of less than 101.3 kPa at 20°C and less than 300 kPa at 50°C."

2.2.2 Class subdivisions

2.2.2.6 Delete subparagraph ".4" and add the following note at the end:

"Note: This exemption does not apply to lamps. For lamps see 1.1.1.9".

Chapter 2.3 – Class 3 – Flammable liquids

2.3.2 Assignment of packing group

2.3.2.2 and 2.3.2.3 Replace existing paragraphs with the following:

"2.3.2.2 Viscous flammable liquids such as paints, enamels, lacquers, varnishes, adhesives and polishes having a flash point of less than 23°C may be placed in packing group III in conformity with the procedures prescribed in the Manual of Tests and Criteria, Part III, sub-section 32.3, provided that:

.1 The viscosity expressed as the flowtime in seconds and flash point are in accordance with the following table:

*Flow-time **t** in seconds*	*Jet diameter (mm)*	*Flash point, closed-cup (°C)*
$20 < t \leq 60$	4	above 17
$60 < t \leq 100$	4	above 10
$20 < t \leq 32$	6	above 5
$32 < t \leq 44$	6	above -1
$44 < t \leq 100$	6	above -5
$100 < t$	6	no limit

.2 Less than 3% of the clear solvent layer separates in the solvent separation test;

.3 The mixture or any separated solvent does not meet the criteria for Class 6.1 or Class 8;

.4 The substances are packed in receptacles of not more than 30-litre capacity.

2.3.2.3 *Reserved.*"

2.3.2.5 At the beginning, replace "Viscous substances" with "Viscous liquids". Amend the fourth indent to read as follows:

"- are packed in receptacles of not more than 30-litre capacity".

Chapter 2.4 – Class 4 – Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases

2.4.4 Class 4.3 – Substances which, in contact with water, emit flammable gases

2.4.4.1 Definitions and properties

2.4.4.1.2 Replace "light bulbs" with "lamps"

Chapter 2.5 – Class 5 – Oxidizing substances and organic peroxides

2.5.1 Definitions and general provisions

2.5.2 Class 5.1 – Oxidizing substances

2.5.2.2 Oxidizing solids

2.5.2.2.1 *Classification of solid substances of class 5.1*

2.5.2.2.1.1 Amend to read as follows:

"2.5.2.2.1.1 Tests are performed to measure the potential for the solid substance to increase the burning rate or burning intensity of a combustible substance when the two are thoroughly mixed. The procedure is given in the Manual of Tests and Criteria, part III, sub-section 34.4.1 (test O.1) or alternatively, in sub-section 34.4.3 (test O.3). Tests are conducted on the substance to be evaluated mixed with dry fibrous cellulose in mixing ratios of 1:1 and 4:1, by mass, of sample to cellulose. The burning characteristics of the mixtures are compared:

.1 in the test O.1, with the standard 3:7 mixture, by mass, of potassium bromate to cellulose. If the burning time is equal to or less than this standard mixture, the burning times shall be compared with those from the packing group I or II reference standards, 3:2 and 2:3 ratios, by mass, of potassium bromate to cellulose respectively; or

.2 in the test O.3, with the standard 1:2 mixture, by mass, of calcium peroxide to cellulose. If the burning rate is equal to or greater than this standard mixture, the burning rates shall be compared with those from the packing group I or II reference standards 3:1 and 1:1 ratios, by mass, of calcium peroxide to cellulose, respectively."

2.5.2.2.1.2 Amend to read as follows:

"2.5.2.2.1.2 The classification test results are assessed on the basis of:

.1 the comparison of the mean burning time (for the test O.1) or burning rate (for the test O.3) with those of the reference mixtures; and

.2 whether the mixture of substance and cellulose ignites and burns."

2.5.2.2.1.3 Amend to read as follows:

"2.5.2.2.1.3 A solid substance is classified in Class 5.1 if the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits:

.1 in the test O.1, 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 ; or

.2 in the test O.3, a mean burning rate equal to or greater than the mean burning rate of a 1:2 mixture (by mass) of calcium peroxide and cellulose."

2.5.2.2.2 *Assignment of packing groups*

2.5.2.2.2 Amend to read as follows:

"2.5.2.2.2 Assignment of packing groups

Solid oxidizing substances are assigned to a packing group according to one of the test procedures in the Manual of Tests and Criteria, Part III, sub-section 34.4.1 (test O.1) or sub-section 34.4.3 (test O.3), in accordance with the following criteria:

.1 Test O.1:

(i) 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;

(ii) 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;

(iii) 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;

(iv) Not Class 5.1: any substance which, in both the 4:1 and 1:1 sample-to-cellulose ratio (by mass) tested, does not ignite and burn, or exhibits mean burning times greater than that of a 3:7 mixture (by mass) of potassium bromate and cellulose.

.2 Test O.3:

(i) Packing group I: any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate greater than the mean burning rate of a 3:1 mixture (by mass) of calcium peroxide and cellulose;

(ii) Packing group II: any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate equal to or greater than the mean burning rate of a 1:1 mixture (by mass) of calcium peroxide and cellulose, and the criteria for packing group I are not met;

(iii) Packing group III: any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate equal to or greater than the mean burning rate of a 1:2 mixture (by mass) of calcium peroxide and cellulose, and the criteria for packing groups I and II are not met;

(iv) Not Class 5.1: any substance which, in both the 4:1 and 1:1 sample-to-cellulose ratio (by mass) tested, does not ignite and burn, or exhibits a mean burning rate less than the mean burning rate of a 1:2 mixture (by mass) of calcium peroxide and cellulose."

2.5.2.3.1.1 At the end of the second sentence after "3.4.4.2" insert "(test O.2)".

Chapter 2.6 – Class 6 – Toxic and infectious substances

2.6.3 Class 6.2 – Infectious substances

2.6.3.2.3 *Exemptions*

2.6.3.2.3.5 Amend to read as follows:

"2.6.3.2.3.5 Dried blood spots, collected by applying a drop of blood onto absorbent material, are not subject to the provisions of this Code."

and insert two new paragraphs 2.6.3.2.3.6 and 2.6.3.2.3.7 to read as follows and renumber existing paragraphs accordingly:

"2.6.3.2.3.6 Faecal occult blood screening samples are not subject to the provisions of this Code.

2.6.3.2.3.7 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 as well as samples drawn in connection with such purposes are not subject to the provisions of this Code."

Chapter 2.7 – Class 7 – Radioactive material

2.7.1.3 Definitions of specific terms

2.7.1.3 Amend the definitions hereafter as follows:

Fissile nuclides: Amend the end of the introductory text before subparagraph .1 to read: "of fissile material are the following:".

In subparagraph .1, delete "and".

Insert the following new subparagraphs and text:

".3 material with fissile nuclides less than a total of 0.25 g;

.4 any combination of .1, .2 and/or .3.

These exclusions are only valid if there is no other material with fissile nuclides in the package or in the consignment if shipped unpackaged."

Surface contaminated object: at the end, replace "surfaces" with "surface".

2.7.2 Classification

2.7.2.1 General provisions

2.7.2.1.1 Amend to read as follows:

"Radioactive material shall be assigned to one of the UN numbers specified in table 2.7.2.1.1, in accordance with 2.7.2.4.2 to 2.7.2.5, taking into account the material characteristics determined in 2.7.2.3."

Table 2.7.2.1.1 – Assignment of UN Numbers

2.7.2.1.1 Amend the table as follows:

Table 2.7.2.1.1 Add a new heading row to read:
"

UN Nos.	Proper shipping name and description

For UN Nos. 2912, 3321, 3322, 2913, 2915, 3332, 2916, 2917, 3323, 2919 and 2978, insert a reference to a new note "b" after "fissile-excepted".

Under the headings "Excepted packages" and "Uranium hexafluoride" add the following new entry:

"UN 3507 URANIUM HEXAFLUORIDE, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE less than 0.1 kg per package, non-fissile or fissile-excepted[b,c]"

Add the following table notes "a", "b" and "c" after the table:

"[a] *The proper shipping name is found in the column "proper shipping name and description" and is restricted to that part shown in capital letters. In the*

cases of UN Nos. 2909, 2911, 2913 and 3326, where alternative proper shipping names are separated by the word "or" only the relevant proper shipping name shall be used.

[b] *The term "fissile-excepted" refers only to material excepted under 2.7.2.3.5.*

[c] *For UN No. 3507, see also special provision 369 in Chapter 3.3.*"

2.7.2.2 Determination of activity level

2.7.2.2.1 In .2, insert "limits" after "concentration".

Table 2.7.2.2.1 In the heading of column 4 insert "limit" after "concentration". In (a) after the table, in the introductory sentence, replace "from daughter radionuclides" with "from their progeny".

2.7.2.2.2 Amend the text before the table to read as follows:

"2.7.2.2.2 For individual radionuclides:

.1 Which are not listed in table 2.7.2.2.1 the determination of the basic radionuclide values referred to in 2.7.2.2.1 shall require multilateral approval. For these radionuclides, activity concentration limits for exempt material and activity limits for exempt consignments shall be calculated in accordance with the principles established in the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, Safety Series No.115, IAEA, Vienna (1996). 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 transport are taken into consideration. Alternatively, the radionuclide values in table 2.7.2.2.2 may be used without obtaining competent authority approval;

.2 In instruments or articles in which the radioactive material is enclosed or is included as a component part of the instrument or other manufactured article and which meet 2.7.2.4.1.3.3, alternative basic radionuclide values to those in table 2.7.2.2.1 for the activity limit for an exempt consignment are permitted and shall require multilateral approval. Such alternative activity limits for an exempt consignment shall be calculated in accordance with the principles set out in the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, Safety Series No.115, IAEA, Vienna (1996)."

Table 2.7.2.2.2 – Basic radionuclide values for unknown radionuclides or mixtures

In the table for 2.7.2.2.2, in the heading of the fourth column, insert "limit" after "concentration".

2.7.2.2.4 In the introductory sentence delete "the determination of" and in the legend for X(i) and X_m replace "concentration" with "concentration limit".

2.7.2.3 Determination of other material characteristics

2.7.2.3.1 *Low specific activity (LSA) material*

2.7.2.3.1.2.1 In subparagraph "(i)", delete "which are intended to be processed for the use of these radionuclides".

2.7.2.3.1.2.1 Subparagraph "(iii)" to read:

> "(iii) radioactive material for which the A2 value is unlimited. Fissile material may be included only if excepted under 2.7.2.3.5;".

2.7.2.3.1.2.1 (iv), replace ", excluding fissile material not excepted under 2.7.2.3.5" with ". Fissile material may be included only if excepted under 2.7.2.3.5".

2.7.2.3.1.2.2 In subparagraph "(i)", delete "or".

2.7.2.3.1.2.3 In the introductory sentence, replace "meeting the requirements" with "that meet the requirements".

2.7.2.3.1.2.3 In subparagraph "(i)" replace "bitumen, ceramic, etc." with "bitumen and ceramic".

2.7.2.3.2 *Surface contaminated object (SCO)*

2.7.2.3.2.1 At the end of subparagraph "(ii)", replace "and" with "or".

2.7.2.3.2.2 At the end of subparagraph "(ii)", replace "and" with "or".

2.7.2.3.3 *Special form radioactive material*

2.7.2.3.3.6.1 Amend subparagraph ".1" to read as follows:

> ".1 The tests prescribed in 2.7.2.3.3.5.1 and 2.7.2.3.3.5.2 provided that the specimens are alternatively subjected to the impact test prescribed in ISO 2919:2012: "Radiation Protection – Sealed Radioactive Sources – General requirements and classification":
>
> (i) The Class 4 impact test if the mass of the special form radioactive material is less than 200 g; and
>
> (ii) The Class 5 impact test if the mass of the special form radioactive material is equal to or more than 200 g but less than 500 g;".

2.7.2.3.3.6.2 Replace the reference "ISO 2919:1999" with "ISO 2919:2012".

2.7.2.3.3.8.2 Replace "which are acceptable" with "provided that they are acceptable".

2.7.2.3 Determination of other material characteristics

2.7.2.3.5 Fissile material

2.7.2.3.5 Amend the first paragraph to read as follows:

"Fissile material and packages containing fissile material shall be classified under the relevant entry as "FISSILE" in accordance with table 2.7.2.1.1 unless excepted by one of the provisions of subparagraphs .1 to .6 below and transported subject to the requirements of 5.1.5.5. All provisions apply only to material in packages that meets the requirements of 6.4.7.2 unless unpackaged material is specifically allowed in the provision."

2.7.2.3.5 *Fissile material*

2.7.2.3.5 Delete current subparagraphs ".1" and ".4". Current ".2" and ".3" are renumbered as ".1" and ".2" respectively.

2.7.2.3.5 Insert the following new subparagraphs ".3 to .6":

".3 Uranium with a maximum uranium enrichment of 5% by mass uranium-235 provided:

(i) there is no more than 3.5 g of uranium-235 per package;

(ii) the total plutonium and uranium-233 content does not exceed 1% of the mass of uranium-235 per package;

(iii) Transport of the package is subject to the consignment limit provided in 5.1.5.5.3;

.4 Fissile nuclides with a total mass not greater than 2.0 g per package provided the package is transported subject to the consignment limit provided in 5.1.5.5.4;

.5 Fissile nuclides with a total mass not greater than 45 g either packaged or unpackaged subject to limits provided in 5.1.5.5.5; and

.6 A fissile material that meets the requirements of 5.1.5.5.2, 2.7.2.3.6 and 5.1.5.2.1.".

Table 2.7.2.3.5 – Consignment mass limits for exceptions from the requirements for packages containing fissile material

Table 2.7.2.3.5 is deleted.

Insert a new paragraph 2.7.2.3.6 to read as follows:

"2.7.2.3.6 A fissile material excepted from classification as "FISSILE" under 2.7.2.3.5.6 shall be subcritical without the need for accumulation control under the following conditions:

.1 The conditions of 6.4.11.1 (a);

.2 The conditions consistent with the assessment provisions stated in 6.4.11.12 (b) and 6.4.11.13 (b) for packages; and

.3 The conditions specified in 6.4.11.11 (a), if transported by air."

2.7.2.4 Classification of packages or unpacked material

2.7.2.4.1 *Classification as excepted package*

2.7.2.4.1.1 Amend to read as follows:

"2.7.2.4.1.1 A package may be classified as an excepted package if it meets one of the following conditions:

.1 It is an empty package having contained radioactive material;

.2 It contains instruments or articles not exceeding the activity limits specified in columns (2) and (3) of table 2.7.2.4.1.2;

.3 It contains articles manufactured of natural uranium, depleted uranium or natural thorium;

.4 It contains radioactive material not exceeding the activity limits specified in column (4) of table 2.7.2.4.1.2; or

.5 It contains less than 0.1 kg of uranium hexafluoride not exceeding the activity limits specified in column (4) of table 2.7.2.4.1.2."

2.7.2.4.1.3 In the introductory sentence replace "only if" with "provided that".

2.7.2.4.1.3.2 Replace "except" with "on its external surface except for the following:"

and amend (ii) to read as follows:

"(ii) consumer products that either have received regulatory approval in accordance with 1.5.1.4.5 or do not individually exceed the activity limit for an exempt consignment in table 2.7.2.2.1 (column 5), provided such products are transported in a package that bears the marking "RADIOACTIVE" on its internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package; "

and insert a new subparagraph "(iii)" under ".2" to read as follows:

"(iii) Other instruments or articles too small to bear the marking "RADIOACTIVE", provided that they are transported in a package that bears the marking "RADIOACTIVE" on its internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package; and".

2.7.2.4.1.4.2 Amend to read as follows:

".2 The package bears the marking "RADIOACTIVE" on either:

(i) An internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package; or

(ii) The outside of the package, where it is impractical to mark an internal surface."

Insert a new 2.7.2.4.1.5 to read as follows:

"2.7.2.4.1.5 Uranium hexafluoride not exceeding the limits specified in column 4 of table 2.7.2.4.1.2 may be classified under UN 3507 URANIUM HEXAFLUORIDE, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE, less than 0.1 kg per package, non-fissile or fissile-excepted provided that:

.1 The mass of uranium hexafluoride in the package is less than 0.1 kg; and

.2 The conditions of 2.7.2.4.5.1 and 2.7.2.4.1.4.1 and 2.7.2.4.1.4.2 are met."

and existing paragraph 2.7.2.4.1.5 is renumbered as "2.7.2.4.1.7".

2.7.2.4.1.6 Replace "only if" with "provided that".

2.7.2.4.1.7 (former 2.7.2.4.1.5) In the introductory sentence replace "only if" with "provided that".

2.7.2.4.4 *Classification as Type A package*

2.7.2.4.4 In the sentence before the subparagraphs, replace "activities greater than the following:" with "activities greater than either of the following:".

2.7.2.4.4.1 Delete "or".

2.7.2.4.4 In the legend for the formula where "C(j)", delete "and".

2.7.2.4.5 *Classification of uranium hexafluoride*

2.7.2.4.5 Amend to read as follows:

"2.7.2.4.5 *Classification of uranium hexafluoride*

2.7.2.4.5.1 Uranium hexafluoride shall only be assigned to:

.1 UN No.2977, RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE;

.2 UN No.2978, RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, non-fissile or fissile-excepted; or

.3 UN No.3507, URANIUM HEXAFLUORIDE, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE less than 0.1 kg per package, non-fissile or fissile-excepted.

2.7.2.4.5.2 The contents of a package containing uranium hexafluoride shall comply with the following requirements:

.1 For UN Nos. 2977 and 2978, the mass of uranium hexafluoride shall not be different from that allowed for the package design, and for UN 3507, the mass of uranium hexafluoride shall be less than 0.1 kg;

.2 The mass of uranium hexafluoride shall not be 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; and

.3 The uranium hexafluoride shall be in solid form and the internal pressure shall not be above atmospheric pressure when presented for transport."

2.7.2.4.6 *Classification as Type B(U), Type B(M) or Type C packages*

2.7.2.4.6.1 Replace "competent authority approval certificate" with "competent authority certificate of approval".

2.7.2.4.6.2 Amend to read:

"2.7.2.4.6.2 The contents of a Type B(U), Type B(M) or Type C package shall be as specified in the certificate of approval".

2.7.2.4.6.3 is deleted.

2.7.2.4.6.4 is deleted.

Chapter 2.9 – Miscellaneous dangerous substances and articles (class 9) and environmentally hazardous substances

Amend "Note 2" to read as follows:

"Although the environmentally hazardous substances (aquatic environment) criteria apply to all hazard classes, except for class 7 (see paragraphs 2.10.2.3, 2.10.2.5 and 2.10.3.2), the criteria have been included in this chapter."

2.9.2 Assignment to class 9

2.9.2.2 Under "Substances which, on inhalation as fine dust, may endanger health", replace all three entries by:

"2212 ASBESTOS, AMPHIBOLE (amosite, tremolite, actinolite, anthophyllite, crocidolite)

2590 ASBESTOS, CHRYSOTILE".

replace the existing heading "Electric double layer capacitors" with "Capacitors",

and replace the existing entry under this heading with the following two entries:

"3499 CAPACITOR, ELECTRIC DOUBLE LAYER (with an energy storage capacity greater than 0.3Wh)

3508 CAPACITOR, ASYMMETRIC (with an energy storage capacity greater than 0.3Wh)."

Under "Life-saving appliances", replace the three entries for UN No.3268 by:

"3268 SAFETY DEVICES, electrically initiated".

For "Other substances or articles presenting a danger during transport, but not meeting the definitions of another class", add the following new entry with the corresponding footnote:

"3509 PACKAGING DISCARDED, EMPTY, UNCLEANED**"

Footnote: "** This entry shall not be used for sea transport. Discarded packaging shall meet the requirements of 4.1.1.11."

2.9.4 Lithium batteries

2.9.4.1 Replace the second sentence with the following:

"Cells and batteries manufactured according to a type meeting the requirements of subsection 38.3 of the Manual of Tests and Criteria, Revision 3, Amendment 1 or any subsequent revision and amendment applicable at the date of the type testing may continue to be transported, unless otherwise provided in this Code.

Cell and battery types only meeting the requirements of the Manual of Tests and Criteria, Revision 3, are no longer valid. However, cells and batteries manufactured in conformity with such types before 1 July 2003 may continue to be transported if all other applicable requirements are fulfilled."

and amend the note to read as follows:

"**Note:** Batteries shall be of a type proved to meet the testing requirements of the *Manual of Tests and Criteria*, part III, sub-section 38.3, irrespective of whether the cells of which they are composed are of a tested type."

Chapter 2.10 – Marine Pollutants

2.10.2 General provisions

2.10.2.4 Amend to read as follows:

"2.10.2.4 Column 4 of the Dangerous Goods List also provides information on marine pollutants using the symbol **P** for single entries. The absence of the symbol P or the presence of a "-" in that column does not preclude the application of 2.10.3."

2.10.2.7 Add a new paragraph 2.10.2.7 as follows:

"*2.10.2.7 Marine pollutants packaged in single or combination packagings containing a net quantity per single or inner packaging of 5 l or less for*

liquids or having a net mass per single or inner packaging of 5 kg or less for solids are not subject to any other provisions of this Code relevant to marine pollutants provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8. In the case of marine pollutants also meeting the criteria for inclusion in another hazard class all provisions of this Code relevant to any additional hazards continue to apply."

2.10.3 Classification

2.10.3.2 Add a new paragraph "2.10.3.2" to read as follows:

"2.10.3.2 The classification criteria of 2.9.3 are not applicable to substances or materials of class 7."

PART 3
DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND EXEMPTIONS

3.1 General

3.1.2 Proper shipping names

3.1.2.9 Marine pollutants

3.1.2.9.1 Replace the existing paragraph 3.1.2.9.1 to read as follows:

"3.1.2.9.1 For the purpose of documentation, the Proper Shipping Name of generic or "not otherwise specified" (N.O.S.) entries which are classified as marine pollutants in accordance with 2.10.3, shall be supplemented with the recognized chemical name of the constituent which most predominantly contributes to the classification as marine pollutant."

3.1.4 Segregation groups

3.1.4.1 In the paragraph, replace the words "column 16" with "column 16b".

Chapter 3.2 – Dangerous Goods List

3.2.1 Structure of the dangerous goods list

3.2.1 The following sentence is added at the end of column 4: "The absence of the symbol **P** or the presence of a "-" in that column does not preclude the application of 2.10.3."

3.2.1 The text for column 16 "column 16 Stowage and segregation – this column contains the stowage and segregation provisions as prescribed in part 7." is replaced with the following:

"Column 16a Stowage and handling – this column contains the stowage and handling codes as specified in 7.1.5 and 7.1.6.

Column 16 b Segregation – this column contains the segregation codes as specified in 7.2.8."

Dangerous Goods List

Replace the existing "column 16" with column "16a Stowage and handling" and "column "16b Segregation" as follows:

REORGANIZATION OF COLUMN 16 IN THE DANGEROUS GOODS LIST OF THE IMDG CODE

UN Number	PROPER SHIPPING NAME (Note: When there is more than one packing group or PSN the UN No. has been annotated with a, b, c)	Class or division	Subsidiary risk(s)	Packing Group	Stowage and Handling	Segregation
1	2	3	4	5	(16a)	(16b)
	3.1.2	"2.0	"2.0	2.0.1.3	7.1, 7.3-7.7	7.2 7.7
0004	AMMONIUM PICRATE dry or wetted with less than 10% water, by mass	1.1D			Category 04 SW1	SG27 SG31
0005	CARTRIDGES FOR WEAPONS with bursting charge	1.1F			Category 05 SW1	
0006	CARTRIDGES FOR WEAPONS with bursting charge	1.1E			Category 04 SW1	
0007	CARTRIDGES FOR WEAPONS with bursting charge	1.2F			Category 05 SW1	
0009	AMMUNITION, INCENDIARY with or without burster, expelling charge or propelling charge	1.2G			Category 03 SW1	
0010	AMMUNITION, INCENDIARY with or without burster, expelling charge or propelling charge	1.3G			Category 03 SW1	
0012	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1.4S			Category 01 SW1	
0014	CARTRIDGES FOR WEAPONS, BLANK or CARTRIDGES, SMALL ARMS, BLANK	1.4S			Category 01 SW1	
0015	AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge	1.2G			Category 03 SW1	
0016	AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge	1.3G			Category 03 SW1	
0018	AMMUNITION, TEAR-PRODUCING with burster, expelling charge or propelling charge	1.2G			Category 03 SW1	SG2
0019	AMMUNITION, TEAR-PRODUCING with burster, expelling charge or propelling charge	1.3G			Category 03 SW1	SG3
0020	AMMUNITION, TOXIC with burster, expelling charge or propelling charge	1.2K			Category 05 SW1	
0021	AMMUNITION, TOXIC with burster, expelling charge or propelling charge	1.3K			Category 05 SW1	
0027	BLACK POWDER (GUNPOWDER) granular, or as a meal	1.1D			Category 04 SW1	
0028	BLACK POWDER (GUNPOWDER), COMPRESSED or BLACK POWDER (GUNPOWDER) IN PELLETS	1.1D			Category 04 SW1	
0029	DETONATORS, NON-ELECTRIC for blasting	1.1B			Category 05 SW1	
0030	DETONATORS, ELECTRIC for blasting	1.1B			Category 05 SW1	
0033	BOMBS with bursting charge	1.1F			Category 05 SW1	
0034	BOMBS with bursting charge	1.1D			Category 04 SW1	
0035	BOMBS with bursting charge	1.2D			Category 04 SW1	
0037	BOMBS, PHOTO-FLASH	1.1F			Category 05 SW1	
0038	BOMBS, PHOTO-FLASH	1.1D			Category 04 SW1	

UN Number	PROPER SHIPPING NAME (Note: When there is more than one packing group or PSN the UN No. has been annotated with a, b, c)	Class or division	Subsidiary risk(s)	Packing Group	Stowage and Handling	Segregation
0039	BOMBS, PHOTO-FLASH	1.2G			Category 03 SW1	
0042	BOOSTERS without detonator	1.1D			Category 04 SW1	
0043	BURSTERS explosive	1.1D			Category 04 SW1	
0044	PRIMERS, CAP TYPE	1.4S			Category 01 SW1	
0048	CHARGES, DEMOLITION	1.1D			Category 04 SW1	
0049	CARTRIDGES, FLASH	1.1G			Category 03 SW1	
0050	CARTRIDGES, FLASH	1.3G			Category 03 SW1	
0054	CARTRIDGES, SIGNAL	1.3G			Category 03 SW1	
0055	CASES, CARTRIDGE, EMPTY, WITH PRIMER	1.4S			Category 01 SW1	
0056	CHARGES, DEPTH	1.1D			Category 04 SW1	
0059	CHARGES, SHAPED without detonator	1.1D			Category 04 SW1	
0060	CHARGES, SUPPLEMENTARY, EXPLOSIVE	1.1D			Category 04 SW1	
0065	CORD, DETONATING flexible	1.1D			Category 04 SW1	
0066	CORD, IGNITER	1.4G			Category 02 SW1	
0070	CUTTERS, CABLE, EXPLOSIVE	1.4S			Category 01 SW1	
0072	CYCLOTRIMETHYLENETRINITRAMINE, (CYCLONITE), (RDX), (HEXOGEN), WETTED with not less than 15% water, by mass	1.1D			Category 04 SW1	
0073	DETONATORS FOR AMMUNITION	1.1B			Category 05 SW1	
0074	DIAZODINITROPHENOL, WETTED with not less than 40% water or mixture of alcohol and water, by mass	1.1A			Category 05 SW1	
0075	DIETHYLENEGLYCOL DINITRATE, DESENSITIZED with not less than 25% non-volatile water-insoluble phlegmatizer, by mass	1.1D			Category 04 SW1	
0076	DINITROPHENOL dry or wetted with less than 15% water, by mass	1.1D			Category 04 SW1	SG31
0077	DINITROPHENOLATES alkali metals, dry or wetted with less than 15% water, by mass	1.3C			Category 04 SW1	SG31
0078	DINITRORESORCINOL dry or wetted with less than 15% water, by mass	1.1D			Category 04 SW1	SG31
0079	HEXANITRODIPHENYLAMINE (DIPICRYLAMINE), (HEXYL)	1.1D			Category 04 SW1	
0081	EXPLOSIVE, BLASTING, TYPE A	1.1D			Category 04 SW1	SG34
0082	EXPLOSIVE, BLASTING, TYPE B	1.1D			Category 04 SW1	SG34
0083	EXPLOSIVE, BLASTING, TYPE C	1.1D			Category 04 SW1	SG28
0084	EXPLOSIVE, BLASTING, TYPE D	1.1D			Category 04 SW1	

UN Number	PROPER SHIPPING NAME (Note: When there is more than one packing group or PSN the UN No. has been annotated with a, b, c)	Class or division	Subsidiary risk(s)	Packing Group	Stowage and Handling	Segregation
0092	FLARES, SURFACE	1.3G			Category 03 SW1	
0093	FLARES, AERIAL	1.3G			Category 03 SW1	
0094	FLASH POWDER	1.1G			Category 03 SW1	
0099	FRACTURING DEVICES,EXPLOSIVE for oil wells, without detonator	1.1D			Category 04 SW1	
0101	FUSE, NON-DETONATING	1.3G			Category 03 SW1	
0102	CORD (FUSE), DETONATING metal-clad	1.2D			Category 04 SW1	
0103	FUSE, IGNITER tubular, metal-clad	1.4G			Category 02 SW1	
0104	CORD (FUSE), DETONATING, MILD EFFECT metal-clad	1.4D			Category 02 SW1	
0105	FUSE, SAFETY	1.4S			Category 01 SW1	
0106	FUZES, DETONATING	1.1B			Category 05 SW1	
0107	FUZES, DETONATING	1.2B			Category 05 SW1	
0110	GRENADES, PRACTICE hand or rifle	1.4S			Category 01 SW1	
0113	GUANYL NITROSAMINOGUANYLIDENE HYDRAZINE, WETTED with not less than 30% water, by mass	1.1A			Category 05 SW1	
0114	GUANYL NITROSAMINOGUANYLTETRAZENE (TETRAZENE), WETTED with not less than 30% water or mi	1.1A			Category 05 SW1	
0118	HEXOLITE (HEXOTOL) dry or wetted with less than 15% water, by mass	1.1D			Category 04 SW1	
0121	IGNITERS	1.1G			Category 03 SW1	
0124	JET PERFORATING GUNS, CHARGED oil well, without detonator	1.1D			Category 04 SW1	
0129	LEAD AZIDE, WETTED with not less than 20% water, or mixture of alcohol and water, by mas	1.1A			Category 05 SW1	
0130	LEAD STYPHNATE (LEAD TRINITRORESORCINATE), WETTED with not less than 20% water, or mixtu	1.1A			Category 05 SW1	
0131	LIGHTERS, FUSE	1.4S			Category 01 SW1	
0132	DEFLAGRATING METAL SALTS OF AROMATIC NITRODERIVATIVES, N.O.S.	1.3C			Category 04 SW1	SG31
0133	MANNITOL HEXANITRATE (NITROMANNITE), WETTED with not less than 40% water, or mixture of alcohol and water, by mass	1.1D			Category 04 SW1	
0135	MERCURY FULMINATE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	1.1A			Category 05 SW1	
0136	MINES with bursting charge	1.1F			Category 05 SW1	
0137	MINES with bursting charge	1.1D			Category 04 SW1	
0138	MINES with bursting charge	1.2D			Category 04 SW1	

UN Number	PROPER SHIPPING NAME (Note: When there is more than one packing group or PSN the UN No. has been annotated with a, b, c)	Class or division	Subsidiary risk(s)	Packing Group	Stowage and Handling	Segregation
0143	NITROGLYCERIN, DESENSITIZED with not less than 40% non-volatile water-insoluble phlegmatizer, by mass	1.1D			Category 04 SW1	
0144	NITROGLYCERIN SOLUTION IN ALCOHOL with more than 1% but not more than 10% nitroglycerin	1.1D			Category 04 SW1	
0146	NITROSTARCH dry or wetted, with less than 20% water, by mass	1.1D			Category 04 SW1	
0147	NITRO UREA	1.1D			Category 04 SW1	
0150	PENTAERYTHRITE TETRANITRATE (PENTAERYTHRITOL TETRANITRATE; PETN), WETTED with not less than 25% water, by mass or PENTAERYTHRITE TETRA NITRATE (PENTAERYTHRITOL TETRANITRATE; PETN), DESENSITIZED with not less than 15% phlegmatizer, by mass	1.1D			Category 04 SW1	
0151	PENTOLITE dry or wetted with less than 15% water, by mass	1.1D			Category 04 SW1	
0153	TRINITROANILINE (PICRAMIDE)	1.1D			Category 04 SW1	
0154	TRINITROPHENOL (PICRIC ACID) dry or wetted with less than 30% water, by mass	1.1D			Category 04 SW1	SG31
0155	TRINITROCHLOROBENZENE (PICRYL CHLORIDE)	1.1D			Category 04 SW1	
0159	POWDER CAKE (POWDER PASTE), WETTED with not less than 25% water, by mass	1.3C			Category 04 SW1	
0160	POWDER, SMOKELESS	1.1C			Category 04 SW1	
0161	POWDER, SMOKELESS	1.3C			Category 04 SW1	
0167	PROJECTILES with bursting charge	1.1F			Category 05 SW1	
0168	PROJECTILES with bursting charge	1.1D			Category 04 SW1	
0169	PROJECTILES with bursting charge	1.2D			Category 04 SW1	
0171	AMMUNITION, ILLUMINATING with or without burster, expelling charge or propelling charge	1.2G			Category 03 SW1	
0173	RELEASE DEVICES, EXPLOSIVE	1.4S			Category 01 SW1	
0174	RIVETS, EXPLOSIVE	1.4S			Category 01 SW1	
0180	ROCKETS with bursting charge	1.1F			Category 05 SW1	
0181	ROCKETS with bursting charge	1.1E			Category 04 SW1	
0182	ROCKETS with bursting charge	1.2E			Category 04 SW1	
0183	ROCKETS with inert head	1.3C			Category 04 SW1	
0186	ROCKET MOTORS	1.3C			Category 04 SW1	
0190	SAMPLES, EXPLOSIVE other than initiating explosive	1			Category 05 SW1	

UN Number	PROPER SHIPPING NAME (Note: When there is more than one packing group or PSN the UN No. has been annotated with a, b, c)	Class or division	Subsidiary risk(s)	Packing Group	Stowage and Handling	Segregation
0191	SIGNAL DEVICES, HAND	1.4G			Category 02 SW1	
0192	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.1G			Category 03 SW1	
0193	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.4S			Category 01 SW1	
0194	SIGNALS, DISTRESS ship	1.1G			Category 03 SW1	
0195	SIGNALS, DISTRESS ship	1.3G			Category 03 SW1	
0196	SIGNALS, SMOKE	1.1G			Category 03 SW1	
0197	SIGNALS, SMOKE	1.4G			Category 02 SW1	
0204	SOUNDING DEVICES, EXPLOSIVE	1.2F			Category 05 SW1	
0207	TETRANITROANILINE	1.1D			Category 04 SW1	
0208	TRINITROPHENYLMETHYLNITRAMINE (TETRYL)	1.1D			Category 04 SW1	
0209	TRINITROTOLUENE (TNT) dry or wetted with less than 30% water, by mass	1.1D			Category 04 SW1	
0212	TRACERS FOR AMMUNITION	1.3G			Category 03 SW1	
0213	TRINITROANISOLE	1.1D			Category 04 SW1	
0214	TRINITROBENZENE dry or wetted with less than 30% water, by mass	1.1D			Category 04 SW1	
0215	TRINITROBENZOIC ACID dry or wetted with less than 30% water, by mass	1.1D			Category 04 SW1	
0216	TRINITRO-m-CRESOL	1.1D			Category 04 SW1	SG31
0217	TRINITRONAPHTHALENE	1.1D			Category 04 SW1	
0218	TRINITROPHENETOLE	1.1D			Category 04 SW1	
0219	TRINITRORESORCINOL (STYPHNIC ACID) dry or wetted with less than 20% water, or mixture of	1.1D			Category 04 SW1	SG27
0220	UREA NITRATE dry or wetted with less than 20% water, by mass	1.1D			Category 04 SW1	
0221	WARHEADS, TORPEDO with bursting charge	1.1D			Category 04 SW1	
0222	AMMONIUM NITRATE with more than 0.2% by mass of combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	1.1D			Category 04 SW1	SG27
0224	BARIUM AZIDE, dry or wetted with less than 50% water, by mass	1.1A			Category 05 SW1	
0225	BOOSTERS WITH DETONATOR	1.1B			Category 05 SW1	
0226	CYCLOTETRAMETHYLENETETRA NITRAMINE (HMX; OCTOGEN), WETTED with not less than 15% water, by mass	1.1D			Category 04 SW1	
0234	SODIUM DINITRO-ortho-CRESOLATE dry or wetted with less than 15% water, by mass	1.3C			Category 04 SW1	SG31

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0235	SODIUM PICRAMATE dry or wetted with less than 20% water, by mass	1.3C			Category 04 SW1	SG31
0236	ZIRCONIUM PICRAMATE dry or wetted with less than 20% water, by mass	1.3C			Category 04 SW1	SG31
0237	CHARGES, SHAPED, FLEXIBLE, LINEAR	1.4D			Category 02 SW1	
0238	ROCKETS, LINE-THROWING	1.2G			Category 03 SW1	
0240	ROCKETS, LINE-THROWING	1.3G			Category 03 SW1	
0241	EXPLOSIVE, BLASTING, TYPE E	1.1D			Category 04 SW1	SG34
0242	CHARGES, PROPELLING, FOR CANNON	1.3C			Category 04 SW1	
0243	AMMUNITION, INCENDIARY, WHITE PHOSPHORUS with burster, expelling charge or propelling ch	1.2H			Category 05 SW1	
0244	AMMUNITION, INCENDIARY, WHITE PHOSPHORUS with burster, expelling charge or propelling ch	1.3H			Category 05 SW1	
0245	AMMUNITION, SMOKE, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	1.2H			Category 05 SW1	
0246	AMMUNITION, SMOKE, WHITE PHOSPHORUS with burster, expelling charge or propelling charge	1.3H			Category 05 SW1	
0247	AMMUNITION, INCENDIARY liquid or gel, with burster, expelling charge or propelling charg	1.3J			Category 05 SW1	
0248	CONTRIVANCES, WATER-ACTIVATED with burster, expelling charge or propelling charge	1.2L			Category 05 SW1	
0249	CONTRIVANCES, WATER-ACTIVATED with burster, expelling charge or propelling charge	1.3L			Category 05 SW1	
0250	ROCKET MOTORS WITH HYPERGOLIC LIQUIDS with or without expelling charge	1.3L			Category 05 SW1	
0254	AMMUNITION, ILLUMINATING with or without burster, expelling charge or propelling charge	1.3G			Category 03 SW1	
0255	DETONATORS, ELECTRIC for blasting	1.4B			Category 05 SW1	
0257	FUZES, DETONATING	1.4B			Category 05 SW1	
0266	OCTOLITE (OCTOL) dry or wetted with less than 15% water, by mass	1.1D			Category 04 SW1	
0267	DETONATORS, NON-ELECTRIC for blasting	1.4B			Category 05 SW1	
0268	BOOSTERS WITH DETONATOR	1.2B			Category 05 SW1	
0271	CHARGES, PROPELLING	1.1C			Category 04 SW1	
0272	CHARGES, PROPELLING	1.3C			Category 04 SW1	
0275	CARTRIDGES, POWER DEVICE	1.3C			Category 04 SW1	
0276	CARTRIDGES, POWER DEVICE	1.4C			Category 02 SW1	
0277	CARTRIDGES, OIL WELL	1.3C			Category 04 SW1	

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0278	CARTRIDGES, OIL WELL	1.4C			Category 02 SW1	
0279	CHARGES, PROPELLING, FOR CANNON	1.1C			Category 04 SW1	
0280	ROCKET MOTORS	1.1C			Category 04 SW1	
0281	ROCKET MOTORS	1.2C			Category 04 SW1	
0282	NITROGUANIDINE (PICRITE) dry or wetted with less than 20% water, by mass	1.1D			Category 04 SW1	
0283	BOOSTERS without detonator	1.2D			Category 04 SW1	
0284	GRENADES hand or rifle, with bursting charge	1.1D			Category 04 SW1	
0285	GRENADES hand or rifle, with bursting charge	1.2D			Category 04 SW1	
0286	WARHEADS, ROCKET with bursting charge	1.1D			Category 04 SW1	
0287	WARHEADS, ROCKET with bursting charge	1.2D			Category 04 SW1	
0288	CHARGES, SHAPED, FLEXIBLE, LINEAR	1.1D			Category 04 SW1	
0289	CORD, DETONATING flexible	1.4D			Category 02 SW1	
0290	CORD(FUSE), DETONATING metal-clad	1.1D			Category 04 SW1	
0291	BOMBS with bursting charge	1.2F			Category 05 SW1	
0292	GRENADES hand or rifle, with bursting charge	1.1F			Category 05 SW1	
0293	GRENADES hand or rifle, with bursting charge	1.2F			Category 05 SW1	
0294	MINES with bursting charge	1.2F			Category 05 SW1	
0295	ROCKETS with bursting charge	1.2F			Category 05 SW1	
0296	SOUNDING DEVICES, EXPLOSIVE	1.1F			Category 05 SW1	
0297	AMMUNITION, ILLUMINATING with or without burster, expelling charge or propelling charge	1.4G			Category 02 SW1	
0299	BOMBS, PHOTO-FLASH	1.3G			Category 03 SW1	
0300	AMMUNITION, INCENDIARY with or without burster, expelling charge or propelling charge	1.4G			Category 02 SW1	
0301	AMMUNITION, TEAR-PRODUCING with burster, expelling charge or propelling charge	1.4G			Category 02 SW1	SG74
0303	AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge	1.4G			Category 02 SW1	
0305	FLASH POWDER	1.3G			Category 03 SW1	
0306	TRACERS FOR AMMUNITION	1.4G			Category 02 SW1	
0312	CARTRIDGES, SIGNAL	1.4G			Category 02 SW1	
0313	SIGNALS, SMOKE	1.2G			Category 03 SW1	

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0314	IGNITERS	1.2G			Category 03 SW1	
0315	IGNITERS	1.3G			Category 03 SW1	
0316	FUZES, IGNITING	1.3G			Category 03 SW1	
0317	FUZES, IGNITING	1.4G			Category 02 SW1	
0318	GRENADES, PRACTICE hand or rifle	1.3G			Category 03 SW1	
0319	PRIMERS, TUBULAR	1.3G			Category 03 SW1	
0320	PRIMERS, TUBULAR	1.4G			Category 02 SW1	
0321	CARTRIDGES FOR WEAPONS with bursting charge	1.2E			Category 04 SW1	
0322	ROCKET MOTORS WITH HYPERGOLIC LIQUIDS with or without expelling charge	1.2L			Category 05 SW1	
0323	CARTRIDGES, POWER DEVICE	1.4S			Category 01 SW1	
0324	PROJECTILES with bursting charge	1.2F			Category 05 SW1	
0325	IGNITERS	1.4G			Category 02 SW1	
0326	CARTRIDGES FOR WEAPONS, BLANK	1.1C			Category 04 SW1	
0327	CARTRIDGES FOR WEAPONS, BLANK or CARTRIDGES, SMALL ARMS, BLANK	1.3C			Category 04 SW1	
0328	CARTRIDGES FOR WEAPONS, INERT PROJECTILE	1.2C			Category 04 SW1	
0329	TORPEDOES with bursting charge	1.1E			Category 04 SW1	
0330	TORPEDOES with bursting charge	1.1F			Category 05 SW1	
0331	EXPLOSIVE, BLASTING, TYPE B (AGENT, BLASTING, TYPE B)	1.5D			Category 03 SW1	SG34
0332	EXPLOSIVE, BLASTING, TYPE E (AGENT, BLASTING, TYPE E)	1.5D			Category 03 SW1	SG34
0333	FIREWORKS	1.1G			Category 03 SW1	
0334	FIREWORKS	1.2G			Category 03 SW1	
0335	FIREWORKS	1.3G			Category 03 SW1	
0336	FIREWORKS	1.4G			Category 02 SW1	
0337	FIREWORKS	1.4S			Category 01 SW1	
0338	CARTRIDGES FOR WEAPONS, BLANK or CARTRIDGES, SMALL ARMS, BLANK	1.4C			Category 02 SW1	
0339	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1.4C			Category 02 SW1	
0340	NITROCELLULOSE dry or wetted with less than 25% water (or alcohol), by mass	1.1D			Category 04 SW1	
0341	NITROCELLULOSE unmodified or plasticized with less than 18% plasticizing substance, by mass	1.1D			Category 04 SW1	

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0342	NITROCELLULOSE, WETTED with not less than 25% alcohol, by mass	1.3C			Category 04 SW1	
0343	NITROCELLULOSE, PLASTICIZED with not less than 18% plasticizing substance, by mass	1.3C			Category 04 SW1	
0344	PROJECTILES with bursting charge	1.4D			Category 02 SW1	
0345	PROJECTILES inert, with tracer	1.4S			Category 01 SW1	
0346	PROJECTILES with burster or expelling charge	1.2D			Category 04 SW1	
0347	PROJECTILES with burster or expelling charge	1.4D			Category 02 SW1	
0348	CARTRIDGES FOR WEAPONS with bursting charge	1.4F			Category 05 SW1	
0349	ARTICLES, EXPLOSIVE, N.O.S.	1.4S			Category 01 SW1	
0350	ARTICLES, EXPLOSIVE, N.O.S.	1.4B			Category 05 SW1	
0351	ARTICLES, EXPLOSIVE, N.O.S.	1.4C			Category 02 SW1	
0352	ARTICLES, EXPLOSIVE, N.O.S.	1.4D			Category 02 SW1	
0353	ARTICLES, EXPLOSIVE, N.O.S.	1.4G			Category 02 SW1	
0354	ARTICLES, EXPLOSIVE, N.O.S.	1.1L	See SP943		Category 05 SW1	
0355	ARTICLES, EXPLOSIVE, N.O.S.	1.2L	See SP943		Category 05 SW1	
0356	ARTICLES, EXPLOSIVE, N.O.S.	1.3L	See SP943		Category 05 SW1	
0357	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1L			Category 05 SW1	
0358	SUBSTANCES, EXPLOSIVE, N.O.S.	1.2L			Category 05 SW1	
0359	SUBSTANCES, EXPLOSIVE, N.O.S.	1.3L			Category 05 SW1	
0360	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	1.1B			Category 05 SW1	
0361	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	1.4B			Category 05 SW1	
0362	AMMUNITION, PRACTICE	1.4G			Category 02 SW1	
0363	AMMUNITION, PROOF	1.4G			Category 02 SW1	
0364	DETONATORS FOR AMMUNITION	1.2B			Category 05 SW1	
0365	DETONATORS FOR AMMUNITION	1.4B			Category 05 SW1	
0366	DETONATORS FOR AMMUNITION	1.4S			Category 01 SW1	
0367	FUZES, DETONATING	1.4S			Category 01 SW1	
0368	FUZES, IGNITING	1.4S			Category 01 SW1	
0369	WARHEADS, ROCKET with bursting charge	1.1F			Category 05 SW1	

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0370	WARHEADS, ROCKET with burster or expelling charge	1.4D			Category 02 SW1	
0371	WARHEADS, ROCKET with burster or expelling charge	1.4F			Category 05 SW1	
0372	GRENADES, PRACTICE hand or rifle	1.2G			Category 03 SW1	
0373	SIGNAL DEVICES, HAND	1.4S			Category 01 SW1	
0374	SOUNDING DEVICES, EXPLOSIVE	1.1D			Category 04 SW1	
0375	SOUNDING DEVICES, EXPLOSIVE	1.2D			Category 04 SW1	
0376	PRIMERS, TUBULAR	1.4S			Category 01 SW1	
0377	PRIMERS, CAP TYPE	1.1B			Category 05 SW1	
0378	PRIMERS, CAP TYPE	1.4B			Category 05 SW1	
0379	CASES, CARTRIDGE, EMPTY, WITH PRIMER	1.4C			Category 02 SW1	
0380	ARTICLES, PYROPHORIC	1.2L			Category 05 SW1	
0381	CARTRIDGES, POWER DEVICE	1.2C			Category 04 SW1	
0382	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.2B			Category 05 SW1	
0383	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.4B			Category 05 SW1	
0384	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.4S			Category 01 SW1	
0385	5-NITROBENZOTRIAZOL	1.1D			Category 04 SW1	
0386	TRINITROBENZENESULPHONIC ACID	1.1D			Category 04 SW1	SG31
0387	TRINITROFLUORENONE	1.1D			Category 04 SW1	
0388	TRINITROTOLUENE (TNT) AND TRINITROBENZENE MIXTURE or TRINITROTOLUENE (TNT) AND HEXANITROSTILBENE MIXTURE	1.1D			Category 04 SW1	
0389	TRINITROTOLUENE (TNT) MIXTURE CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE	1.1D			Category 04 SW1	
0390	TRITONAL	1.1D			Category 04 SW1	
0391	CYCLOTRIMETHYLENETRINITRAMINE (CYCLONITE; HEXOGEN; RDX) AND CYCLOTETRAMETHYLENETETRANITRAMINE (HMX; OCTOGEN) MIXTURE, WETTED with not less than 15% water, by mass or CYCLOTRIMETHYLENETRINITRAMINE (CYCLONITE; HEXOGEN; RDX) AND CYCLOTETRAMETHYLENETETRANITRAMINE (HMX; OCTOGEN) MIXTURE, DESENSITIZED with not less than 10% phlegmatizer, by mass	1.1D			Category 04 SW1	

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0392	HEXANITROSTILBENE	1.1D			Category 04 SW1	
0393	HEXOTONAL	1.1D			Category 04 SW1	
0394	TRINITRORESORCINOL (STYPHNIC ACID), WETTED with not less than 20% water, or mixture of a	1.1D			Category 04 SW1	SG31
0395	ROCKET MOTORS, LIQUID FUELLED	1.2J			Category 05 SW1	SG67
0396	ROCKET MOTORS, LIQUID FUELLED	1.3J			Category 05 SW1	SG67
0397	ROCKETS, LIQUID FUELLED with bursting charge	1.1J			Category 05 SW1	SG67
0398	ROCKETS, LIQUID FUELLED with bursting charge	1.2J			Category 05 SW1	SG67
0399	BOMBS WITH FLAMMABLE LIQUID with bursting charge	1.1J			Category 05 SW1	SG67
0400	BOMBS WITH FLAMMABLE LIQUID with bursting charge	1.2J			Category 05 SW1	SG67
0401	DIPICRYL SULPHIDE dry or wetted with less than 10% water, by mass	1.1D			Category 04 SW1	
0402	AMMONIUM PERCHLORATE	1.1D			Category 04 SW1	SG27
0403	FLARES, AERIAL	1.4G			Category 02 SW1	
0404	FLARES, AERIAL	1.4S			Category 01 SW1	
0405	CARTRIDGES, SIGNAL	1.4S			Category 01 SW1	
0406	DINITROSOBENZENE	1.3C			Category 04 SW1	
0407	TETRAZOL-1-ACETIC ACID	1.4C			Category 02 SW1	
0408	FUZES, DETONATING with protective features	1.1D			Category 04 SW1	
0409	FUZES, DETONATING with protective features	1.2D			Category 04 SW1	
0410	FUZES, DETONATING with protective features	1.4D			Category 02 SW1	
0411	PENTAERYTHRITE TETRANITRATE (PENTAERYTHRITOL TETRANITRATE; PETN) with not less than 7% wax, by mass	1.1D			Category 04 SW1	
0412	CARTRIDGES FOR WEAPONS with bursting charge	1.4E			Category 03 SW1	
0413	CARTRIDGES FOR WEAPONS, BLANK	1.2C			Category 04 SW1	
0414	CHARGES, PROPELLING, FOR CANNON	1.2C			Category 04 SW1	
0415	CHARGES, PROPELLING	1.2C			Category 04 SW1	
0417	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1.3C			Category 04 SW1	
0418	FLARES, SURFACE	1.1G			Category 03 SW1	
0419	FLARES, SURFACE	1.2G			Category 03 SW1	

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0420	FLARES, AERIAL	1.1G			Category 03 SW1	
0421	FLARES, AERIAL	1.2G			Category 03 SW1	
0424	PROJECTILES inert, with tracer	1.3G			Category 03 SW1	
0425	PROJECTILES inert, with tracer	1.4G			Category 02 SW1	
0426	PROJECTILES with burster or expelling charge	1.2F			Category 05 SW1	
0427	PROJECTILES with burster or expelling charge	1.4F			Category 05 SW1	
0428	ARTICLES, PYROTECHNIC for technical purposes	1.1G			Category 03 SW1	
0429	ARTICLES, PYROTECHNIC for technical purposes	1.2G			Category 03 SW1	
0430	ARTICLES, PYROTECHNIC for technical purposes	1.3G			Category 03 SW1	
0431	ARTICLES, PYROTECHNIC for technical purposes	1.4G			Category 02 SW1	
0432	ARTICLES, PYROTECHNIC for technical purposes	1.4S			Category 01 SW1	
0433	POWDER CAKE (POWDER PASTE), WETTED with not less than 17% alcohol, by mass	1.1C			Category 04 SW1	
0434	PROJECTILES with burster or expelling charge	1.2G			Category 03 SW1	
0435	PROJECTILES with burster or expelling charge	1.4G			Category 02 SW1	
0436	ROCKETS with expelling charge	1.2C			Category 04 SW1	
0437	ROCKETS with expelling charge	1.3C			Category 04 SW1	
0438	ROCKETS with expelling charge	1.4C			Category 02 SW1	
0439	CHARGES, SHAPED without detonator	1.2D			Category 04 SW1	
0440	CHARGES, SHAPED without detonator	1.4D			Category 02 SW1	
0441	CHARGES, SHAPED without detonator	1.4S			Category 01 SW1	
0442	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1.1D			Category 04 SW1	
0443	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1.2D			Category 04 SW1	
0444	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1.4D			Category 02 SW1	
0445	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1.4S			Category 01 SW1	
0446	CASES, COMBUSTIBLE, EMPTY, WITHOUT PRIMER	1.4C			Category 02 SW1	
0447	CASES, COMBUSTIBLE, EMPTY, WITHOUT PRIMER	1.3C			Category 04 SW1	
0448	5-MERCAPTOTETRAZOL-1-ACETIC ACID	1.4C			Category 02 SW1	
0449	TORPEDOES, LIQUID-FUELLED with or without bursting charge	1.1J			Category 05 SW1	SG67

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0450	TORPEDOES, LIQUID-FUELLED with inert head	1.3J			Category 05 SW1	SG67
0451	TORPEDOES with bursting charge	1.1D			Category 04 SW1	
0452	GRENADES, PRACTICE hand or rifle	1.4G			Category 02 SW1	
0453	ROCKETS, LINE-THROWING	1.4G			Category 02 SW1	
0454	IGNITERS	1.4S			Category 01 SW1	
0455	DETONATORS, NON-ELECTRIC for blasting	1.4S			Category 01 SW1	
0456	DETONATORS, ELECTRIC for blasting	1.4S			Category 01 SW1	
0457	CHARGES, BURSTING, PLASTICS BONDED	1.1D			Category 04 SW1	
0458	CHARGES, BURSTING, PLASTICS BONDED	1.2D			Category 04 SW1	
0459	CHARGES, BURSTING, PLASTICS BONDED	1.4D			Category 02 SW1	
0460	CHARGES, BURSTING, PLASTICS BONDED	1.4S			Category 01 SW1	
0461	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.1B			Category 05 SW1	
0462	ARTICLES, EXPLOSIVE, N.O.S.	1.1C			Category 04 SW1	
0463	ARTICLES, EXPLOSIVE, N.O.S.	1.1D			Category 04 SW1	
0464	ARTICLES, EXPLOSIVE, N.O.S.	1.1E			Category 04 SW1	
0465	ARTICLES, EXPLOSIVE, N.O.S.	1.1F			Category 05 SW1	
0466	ARTICLES, EXPLOSIVE, N.O.S.	1.2C			Category 04 SW1	
0467	ARTICLES, EXPLOSIVE, N.O.S.	1.2D			Category 04 SW1	
0468	ARTICLES, EXPLOSIVE, N.O.S.	1.2E			Category 04 SW1	
0469	ARTICLES, EXPLOSIVE, N.O.S.	1.2F			Category 05 SW1	
0470	ARTICLES, EXPLOSIVE, N.O.S.	1.3C			Category 04 SW1	
0471	ARTICLES, EXPLOSIVE, N.O.S.	1.4E			Category 03 SW1	
0472	ARTICLES, EXPLOSIVE, N.O.S.	1.4F			Category 05 SW1	
0473	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1A			Category 05 SW1	
0474	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1C			Category 04 SW1	
0475	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1D			Category 04 SW1	
0476	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1G			Category 03 SW1	
0477	SUBSTANCES, EXPLOSIVE, N.O.S.	1.3C			Category 04 SW1	

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0478	SUBSTANCES, EXPLOSIVE, N.O.S.	1.3G			Category 03 SW1	
0479	SUBSTANCES, EXPLOSIVE, N.O.S.	1.4C			Category 02 SW1	
0480	SUBSTANCES, EXPLOSIVE, N.O.S.	1.4D			Category 02 SW1	
0481	SUBSTANCES, EXPLOSIVE, N.O.S.	1.4S			Category 01 SW1	
0482	SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE (SUBSTANCES, EVI), N.O.S.	1.5D			Category 03 SW1	
0483	CYCLOTRIMETHYLENETRINITRAMINE (CYCLONITE; HEXOGEN; RDX), DESENSITIZED	1.1D			Category 04 SW1	
0484	CYCLOTETRAMETHYLENETETRANITRAMINE (OCTOGEN; HMX), DESENSITIZED	1.1D			Category 04 SW1	
0485	SUBSTANCES, EXPLOSIVE, N.O.S.	1.4G			Category 02 SW1	
0486	ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE (ARTICLES, EEI)	1.6N			Category 03 SW1	
0487	SIGNALS, SMOKE	1.3G			Category 03 SW1	
0488	AMMUNITION, PRACTICE	1.3G			Category 03 SW1	
0489	DINITROGLYCOLURIL (DINGU)	1.1D			Category 04 SW1	
0490	NITROTRIAZOLONE (NTO)	1.1D			Category 04 SW1	
0491	CHARGES, PROPELLING	1.4C			Category 02 SW1	
0492	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.3G			Category 03 SW1	
0493	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.4G			Category 02 SW1	
0494	JET PERFORATING GUNS, CHARGED oil well, without detonator	1.4D			Category 02 SW1	
0495	PROPELLANT, LIQUID	1.3C			Category 04 SW1	
0496	OCTONAL	1.1D			Category 04 SW1	
0497	PROPELLANT, LIQUID	1.1C			Category 04 SW1	
0498	PROPELLANT, SOLID	1.1C			Category 04 SW1	
0499	PROPELLANT, SOLID	1.3C			Category 04 SW1	
0500	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	1.4S			Category 01 SW1	
0501	PROPELLANT, SOLID	1.4C			Category 02 SW1	
0502	ROCKETS with inert head	1.2C			Category 04 SW1	
0503	AIR BAG INFLATORS or AIR BAG MODULES or SEAT-BELT PRETENSIONERS	1.4G			Category 02 SW1	
0504	1H-TETRAZOLE	1.1D			Category 04 SW1	
0505	SIGNALS, DISTRESS, ship	1.4G			Category 02 SW1	

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0506	SIGNALS, DISTRESS, ship	1.4S			Category 01 SW1	
0507	SIGNALS, SMOKE	1.4S			Category 01 SW1	
0508	1-HYDROXYBENZOTRIAZOLE, ANHYDROUS, dry or wetted with less than 20% water, by mass	1.3C			Category 04 SW1	
0509	POWDER, SMOKELESS	1.4C			Category 02 SW1	
1001	ACETYLENE, DISSOLVED	2.1			Category D SW1 SW2	SG46
1002	AIR, COMPRESSED	2.2			Category A	
1003	AIR, REFRIGERATED LIQUID	2.2	5.1		Category D	
1005	AMMONIA, ANHYDROUS	2.3	8		Category D SW2	SG35 SG46
1006	ARGON, COMPRESSED	2.2			Category A	
1008	BORON TRIFLUORIDE	2.3	8		Category D SW2	
1009	BROMOTRIFLUOROMETHANE (REFRIGERANT GAS R 13B1)	2.2			Category A	
1010	BUTADIENES, STABILIZED or BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED with more than 40% butadienes	2.1			Category B SW2	
1011	BUTANE	2.1			Category E SW2	
1012	BUTYLENE	2.1			Category E SW2	
1013	CARBON DIOXIDE	2.2			Category A	
1016	CARBON MONOXIDE, COMPRESSED	2.3	2.1		Category D SW2	
1017	CHLORINE	2.3	5.1/8 P		Category D SW2	SG6 SG19
1018	CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)	2.2			Category A	
1020	CHLOROPENTAFLUOROETHANE (REFRIGERANT GAS R 115)	2.2			Category A	
1021	1-CHLORO-1,2,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 124)	2.2			Category A	
1022	CHLOROTRIFLUOROMETHANE (REFRIGERANT GAS R 13)	2.2			Category A	
1023	COAL GAS, COMPRESSED	2.3	2.1		Category D SW2	
1026	CYANOGEN	2.3	2.1		Category D SW2	
1027	CYCLOPROPANE	2.1			Category E SW2	
1028	DICHLORODIFLUOROMETHANE (REFRIGERANT GAS R 12)	2.2			Category A	
1029	DICHLOROFLUOROMETHANE (REFRIGERANT GAS R 21)	2.2			Category A	
1030	1,1-DIFLUOROETHANE (REFRIGERANT GAS R 152a)	2.1			Category B SW2	
1032	DIMETHYLAMINE, ANHYDROUS	2.1			Category D SW2	
1033	DIMETHYL ETHER	2.1			Category B SW2	
1035	ETHANE	2.1			Category E SW2	

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1036	ETHYLAMINE	2.1			Category D SW2	
1037	ETHYL CHLORIDE	2.1			Category B SW2	
1038	ETHYLENE, REFRIGERATED LIQUID	2.1			Category D SW2	
1039	ETHYL METHYL ETHER	2.1			Category B SW2	
1040	ETHYLENE OXIDE or ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1MPa (10 bar) at 50°C	2.3	2.1		Category D SW2	
1041	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 9% but not more than 87% ethyle	2.1			Category B SW2	
1043	FERTILIZER AMMONIATING SOLUTION with free ammonia	2.2			Category E SW2	
1044	FIRE EXTINGUISHERS with compressed or liquefied gas	2.2			Category A	
1045	FLUORINE, COMPRESSED	2.3	5.1/8		Category D SW2	SG6 SG19
1046	HELIUM, COMPRESSED	2.2			Category A	
1048	HYDROGEN BROMIDE, ANHYDROUS	2.3	8		Category D SW2	
1049	HYDROGEN, COMPRESSED	2.1			Category E SW2	SG46
1050	HYDROGEN CHLORIDE, ANHYDROUS	2.3	8		Category D SW2	
1051	HYDROGEN CYANIDE, STABILIZED containing less than 3% water	6.1	3P	I	Category D SW2	
1052	HYDROGEN FLUORIDE, ANHYDROUS	8	6.1	I	Category D SW2	
1053	HYDROGEN SULPHIDE	2.3	2.1		Category D SW2	
1055	ISOBUTYLENE	2.1			Category E SW2	
1056	KRYPTON, COMPRESSED	2.2			Category A	
1057	LIGHTERS or LIGHTER REFILLS containing flammable gas	2.1			Category B SW2	
1058	LIQUEFIED GASES non-flammable, charged with nitrogen, carbon dioxide or air	2.2			Category A	
1060	METHYLACETYLENE AND PROPADIENE MIXTURE, STABILIZED	2.1			Category B SW2	
1061	METHYLAMINE, ANHYDROUS	2.1			Category B SW2	
1062	METHYL BROMIDE with not more than 2.0% chloropicrin	2.3			Category D SW2	
1063	METHYL CHLORIDE (REFRIGERANT GAS R 40)	2.1			Category D SW2	
1064	METHYL MERCAPTAN	2.3	2.1 P		Category D SW2	
1065	NEON, COMPRESSED	2.2			Category A	
1066	NITROGEN, COMPRESSED	2.2			Category A	
1067	DINITROGEN TETROXIDE (NITROGEN DIOXIDE)	2.3	5.1/8		Category D SW2	SG6 SG19
1069	NITROSYL CHLORIDE	2.3	8		Category D SW2	

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1070	NITROUS OXIDE	2.2	5.1		Category A SW2	
1071	OIL GAS, COMPRESSED	2.3	2.1		Category D SW2	
1072	OXYGEN, COMPRESSED	2.2	5.1		Category A	
1073	OXYGEN, REFRIGERATED LIQUID	2.2	5.1		Category D	
1075	PETROLEUM GASES, LIQUEFIED	2.1			Category E SW2	
1076	PHOSGENE	2.3	8		Category D SW2	
1077	PROPYLENE	2.1			Category E SW2	
1078	REFRIGERANT GAS, N.O.S.	2.2			Category A	
1079	SULPHUR DIOXIDE	2.3	8		Category D SW2	
1080	SULPHUR HEXAFLUORIDE	2.2			Category A	
1081	TETRAFLUOROETHYLENE, STABILIZED	2.1			Category E SW2	
1082	TRIFLUOROCHLOROETHYLENE, STABILIZED	2.3	2.1		Category D SW2	
1083	TRIMETHYLAMINE, ANHYDROUS	2.1			Category B SW2	
1085	VINYL BROMIDE, STABILIZED	2.1			Category B SW2	
1086	VINYL CHLORIDE, STABILIZED	2.1			Category B SW2	
1087	VINYL METHYL ETHER, STABILIZED	2.1			Category B SW2	
1088	ACETAL	3		II	Category E	
1089	ACETALDEHYDE	3		I	Category E	
1090	ACETONE (ACETONE SOLUTIONS)	3		II	Category E	
1091	ACETONE OILS	3		II	Category B	
1092	ACROLEIN, STABILIZED	6.1	3P	I	Category D SW2	
1093	ACRYLONITRILE, STABILIZED	3	6.1	I	Category E SW2	
1098	ALLYL ALCOHOL	6.1	3	I	Category D SW2	
1099	ALLYL BROMIDE	3	6.1 P	I	Category B SW2	
1100	ALLYL CHLORIDE	3	6.1	I	Category E SW2	
1104	AMYL ACETATES	3		III	Category A	
1105	PENTANOLS	3		II	Category B	
1105	PENTANOLS	3		III	Category A	
1106	AMYLAMINES	3	8	II	Category B	
1106	AMYLAMINES	3	8	III	Category A	
1107	AMYL CHLORIDES	3		II	Category B	
1108	1-PENTENE (n-AMYLENE)	3		I	Category E	
1109	AMYL FORMATES	3		III	Category A	
1110	n-AMYL METHYL KETONE	3		III	Category A	

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1111	AMYL MERCAPTANS	3		II	Category B	SG50 SG57
1112	AMYL NITRATES	3		III	Category A SW2	
1113	AMYL NITRITE	3		II	Category E SW2	
1114	BENZENE	3		II	Category B SW2	
1120	BUTANOLS	3		II	Category B	
1120	BUTANOLS	3		III	Category A	
1123	BUTYL ACETATES	3		II	Category B	
1123	BUTYL ACETATES	3		III	Category A	
1125	n-BUTYLAMINE	3	8	II	Category B SW2	
1126	1-BROMOBUTANE	3		II	Category B SW2	
1127	CHLOROBUTANES	3		II	Category B	
1128	n-BUTYL FORMATE	3		II	Category B	
1129	BUTYRALDEHYDE	3		II	Category B	
1130	CAMPHOR OIL	3		III	Category A	
1131	CARBON DISULPHIDE	3	6.1	I	Category D SW2	SG63
1133	ADHESIVES containing flammable liquid	3		I	Category E	
1133	ADHESIVES containing flammable liquid	3		II	Category B	
1133	ADHESIVES containing flammable liquid	3		III	Category A	
1134	CHLOROBENZENE	3		III	Category A	
1135	ETHYLENE CHLOROHYDRIN	6.1	3	I	Category D SW2	
1136	COAL TAR DISTILLATES, FLAMMABLE	3		II	Category B	
1136	COAL TAR DISTILLATES, FLAMMABLE	3		III	Category A	
1139	COATING SOLUTION (includes surface treatments or coatings used for industrial purposes such as vehicle under-coating, drum or barrel lining)	3		I	Category E	
1139	COATING SOLUTION (includes surface treatments or coatings used for industrial purposes such as vehicle under-coating, drum or barrel lining)	3		II	Category B	
1139	COATING SOLUTION (includes surface treatments or coatings used for industrial purposes such as vehicle under-coating, drum or barrel lining)	3		III	Category A	
1143	CROTONALDEHYDE or CROTONALDEHYDE, STABILIZED	6.1	3P	I	Category D SW2	
1144	CROTONYLENE	3		I	Category E	
1145	CYCLOHEXANE	3		II	Category E	
1146	CYCLOPENTANE	3		II	Category E	
1147	DECAHYDRONAPHTHALENES	3		III	Category A	
1148	DIACETONE ALCOHOL	3		II	Category B	
1148	DIACETONE ALCOHOL	3		III	Category A	
1149	DIBUTYL ETHERS	3		III	Category A	

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1150	1,2-DICHLOROETHYLENE	3		II	Category B	
1152	DICHLOROPENTANES	3		III	Category A	
1153	ETHYLENE GLYCOL DIETHYL ETHER	3		II	Category A	
1153	ETHYLENE GLYCOL DIETHYL ETHER	3		III	Category A	
1154	DIETHYLAMINE	3	8	II	Category E SW2	
1155	DIETHYL ETHER (ETHYL ETHER)	3		I	Category E SW2	
1156	DIETHYL KETONE	3		II	Category B	
1157	DIISOBUTYL KETONE	3		III	Category A	
1158	DIISOPROPYLAMINE	3	8	II	Category B	
1159	DIISOPROPYL ETHER	3		II	Category E SW2	
1160	DIMETHYLAMINE, AQUEOUS SOLUTION	3	8	II	Category B	SG35
1161	DIMETHYL CARBONATE	3		II	Category B	
1162	DIMETHYLDICHLOROSILANE	3	8	II	Category B SW2	
1163	DIMETHYLHYDRAZINE, UNSYMMETRICAL	6.1	3/8P	I	Category D SW2	SG5 SG8 SG13 SG35
1164	DIMETHYL SULPHIDE	3		II	Category E SW2	
1165	DIOXANE	3		II	Category B	
1166	DIOXOLANE	3		II	Category B SW2	
1167	DIVINYL ETHER, STABILIZED	3		I	Category E SW2	
1169	EXTRACTS, AROMATIC, LIQUID	3		II	Category B	
1169	EXTRACTS, AROMATIC, LIQUID	3		III	Category A	
1170	ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	3		II	Category A	
1170	ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	3		III	Category A	
1171	ETHYLENE GLYCOL MONOETHYL ETHER	3		III	Category A	
1172	ETHYLENE GLYCOL MONOETHYL ETHER ACETATE	3		III	Category A	
1173	ETHYL ACETATE	3		II	Category B	
1175	ETHYLBENZENE	3		II	Category B	
1176	ETHYL BORATE	3		II	Category B	
1177	2-ETHYLBUTYL ACETATE	3		III	Category A	
1178	2-ETHYLBUTYRALDEHYDE	3		II	Category B	
1179	ETHYL BUTYL ETHER	3		II	Category B	
1180	ETHYL BUTYRATE	3		III	Category A	
1181	ETHYL CHLOROACETATE	6.1	3	II	Category A	
1182	ETHYL CHLOROFORMATE	6.1	"3/8	I	Category D SW2	SG5 SG8
1183	ETHYLDICHLOROSILANE	4.3	"3/8	I	Category D SW2	SG5 SG7 SG8 SG13

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1184	ETHYLENE DICHLORIDE	3	6.1	II	Category B SW2	
1185	ETHYLENEIMINE, STABILIZED	6.1	3	I	Category D SW2	
1188	ETHYLENE GLYCOL MONOMETHYL ETHER	3		III	Category A	
1189	ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE	3		III	Category A	
1190	ETHYL FORMATE	3		II	Category E	
1191	OCTYL ALDEHYDES	3		III	Category A	
1192	ETHYL LACTATE	3		III	Category A	
1193	ETHYL METHYL KETONE (METHYL ETHYL KETONE)	3		II	Category B	
1194	ETHYL NITRITE SOLUTION	3	6.1	I	Category D SW2	
1195	ETHYL PROPIONATE	3		II	Category B	
1196	ETHYLTRICHLOROSILANE	3	8	II	Category B SW2	
1197	EXTRACTS, FLAVOURING, LIQUID	3		II	Category B	
1197	EXTRACTS, FLAVOURING, LIQUID	3		III	Category A	
1198	FORMALDEHYDE SOLUTION, FLAMMABLE	3	8	III	Category A SW2	
1199	FURALDEHYDES	6.1	3	II	Category A	
1201	FUSEL OIL	3		II	Category B	
1201	FUSEL OIL	3		III	Category A	
1202	GAS OIL or DIESEL FUEL or HEATING OIL, LIGHT	3		III	Category A	
1203	MOTOR SPIRIT or GASOLINE or PETROL	3		II	Category E	
1204	NITROGLYCERIN SOLUTION IN ALCOHOL with not more than 1% nitroglycerin	3		II	Category B	
1206	HEPTANES	3		II	Category B	
1207	HEXALDEHYDE	3		III	Category A	
1208	HEXANES	3		II	Category E	
1210	PRINTING INK flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable	3		I	Category E	
1210	PRINTING INK flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable	3		II	Category B	
1210	PRINTING INK flammable or PRINTING INK RELATED MATERIAL (including printing ink thinning or reducing compound), flammable	3		III	Category A	
1212	ISOBUTANOL (ISOBUTYL ALCOHOL)	3		III	Category A	
1213	ISOBUTYL ACETATE	3		II	Category B	
1214	ISOBUTYLAMINE	3	8	II	Category B SW2	
1216	ISOOCTENES	3		II	Category B	
1218	ISOPRENE, STABILIZED	3		I	Category E	
1219	ISOPROPANOL (ISOPROPYL ALCOHOL)	3		II	Category B	
1220	ISOPROPYL ACETATE	3		II	Category B	

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1221	ISOPROPYLAMINE	3	8	I	Category E SW2	
1222	ISOPROPYL NITRATE	3		II	Category D	
1223	KEROSENE	3		III	Category A	
1224	KETONES, LIQUID, N.O.S.	3		II	Category B	
1224	KETONES, LIQUID, N.O.S.	3		III	Category A	
1228	MERCAPTANS, LIQUID, FLAMMABLE, TOXIC, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, TO	3	6.1	II	Category B SW2	SG50 SG57
1228	MERCAPTANS, LIQUID, FLAMMABLE, TOXIC, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S	3	6.1	III	Category B SW2	SG50 SG57
1229	MESITYL OXIDE	3		III	Category A	
1230	METHANOL	3	6.1	II	Category B SW2	
1231	METHYL ACETATE	3		II	Category B	
1233	METHYLAMYL ACETATE	3		III	Category A	
1234	METHYLAL	3		II	Category E	
1235	METHYLAMINE, AQUEOUS SOLUTION	3		II	Category E	SG35 SG54
1237	METHYL BUTYRATE	3		II	Category B	
1238	METHYL CHLOROFORMATE	6.1	"3/8	I	Category D SW2	SG5 SG8
1239	METHYL CHLOROMETHYL ETHER	6.1	3	I	Category D SW2	
1242	METHYLDICHLOROSILANE	4.3	"3/8	I	Category D SW2	SG5 SG7 SG8 SG13
1243	METHYL FORMATE	3		I	Category E	
1244	METHYLHYDRAZINE	6.1	"3/8	I	Category D SW2	SG5 SG8 SG13 SG35
1245	METHYL ISOBUTYL KETONE	3		II	Category B	
1246	METHYL ISOPROPENYL KETONE, STABILIZED	3		II	Category B	
1247	METHYL METHACRYLATE MONOMER, STABILIZED	3		II	Category B SW2	
1248	METHYL PROPIONATE	3		II	Category B	
1249	METHYL PROPYL KETONE	3		II	Category B	
1250	METHYLTRICHLOROSILANE	3	8	II	Category B SW2	
1251	METHYL VINYL KETONE, STABILIZED	6.1	"3/8	I	Category D SW2	SG5 SG8
1259	NICKEL CARBONYL	6.1	3P	I	Category D SW2	SG63
1261	NITROMETHANE	3		II	Category A	
1262	OCTANES	3		II	Category B	
1263	PAINT (including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning or reducing compound)	3		I	Category E	

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1263	PAINT (including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning or reducing compound)	3		II	Category B	
1263	PAINT (including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler and liquid lacquer base) or PAINT RELATED MATERIAL (including paint thinning or reducing compound)	3		III	Category A	
1264	PARALDEHYDE	3		III	Category A	
1265	PENTANES, liquid	3		I	Category E	
1265	PENTANES, liquid	3		II	Category E	
1266	PERFUMERY PRODUCTS with flammable solvents	3		II	Category B	
1266	PERFUMERY PRODUCTS with flammable solvents	3		III	Category A	
1267	PETROLEUM CRUDE OIL	3		I	Category E	
1267	PETROLEUM CRUDE OIL	3		II	Category B	
1267	PETROLEUM CRUDE OIL	3		III	Category A	
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S.	3		I	Category E	
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S.	3		II	Category B	
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S.	3		III	Category A	
1272	PINE OIL	3		III	Category A	
1274	n-PROPANOL (PROPYL ALCOHOL, NORMAL)	3		II	Category B	
1274	n-PROPANOL (PROPYL ALCOHOL, NORMAL)	3		III	Category A	
1275	PROPIONALDEHYDE	3		II	Category E	
1276	n-PROPYL ACETATE	3		II	Category B	
1277	PROPYLAMINE	3	8	II	Category E SW2	
1278	1-CHLOROPROPANE	3		II	Category E	
1279	1,2-DICHLOROPROPANE	3		II	Category B	
1280	PROPYLENE OXIDE	3		I	Category E SW2	
1281	PROPYL FORMATES	3		II	Category B	
1282	PYRIDINE	3		II	Category B SW2	
1286	ROSIN OIL	3		II	Category B	
1286	ROSIN OIL	3		III	Category A	
1287	RUBBER SOLUTION	3		II	Category B	
1287	RUBBER SOLUTION	3		III	Category A	
1288	SHALE OIL	3		II	Category B	
1288	SHALE OIL	3		III	Category A	
1289	SODIUM METHYLATE SOLUTION in alcohol	3	8	II	Category B	
1289	SODIUM METHYLATE SOLUTION in alcohol	3	8	III	Category A	
1292	TETRAETHYL SILICATE	3		III	Category A	
1293	TINCTURES, MEDICINAL	3		II	Category B	

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1293	TINCTURES, MEDICINAL	3		III	Category A	
1294	TOLUENE	3		II	Category B	
1295	TRICHLOROSILANE	4.3	"8/3	I	Category D SW2	SG5 SG7 SG8 SG13 SG72
1296	TRIETHYLAMINE	3	8	II	Category B SW2	
1297	TRIMETHYLAMINE, AQUEOUS SOLUTION not more than 50% trimethylamine, by mass	3	8	I	Category D SW2	SG54
1297	TRIMETHYLAMINE, AQUEOUS SOLUTION not more than 50% trimethylamine, by mass	3	8	II	Category B SW2	SG54
1297	TRIMETHYLAMINE, AQUEOUS SOLUTION not more than 50% trimethylamine, by mass	3	8	III	Category A SW2	SG54
1298	TRIMETHYLCHLOROSILANE	3	8	II	Category E SW2	
1299	TURPENTINE	3		III	Category A	
1300	TURPENTINE SUBSTITUTE	3		II	Category B	
1300	TURPENTINE SUBSTITUTE	3		III	Category A	
1301	VINYL ACETATE, STABILIZED	3		II	Category B	
1302	VINYL ETHYL ETHER, STABILIZED	3		I	Category D	
1303	VINYLIDENE CHLORIDE, STABILIZED	3	P	I	Category E SW2	
1304	VINYL ISOBUTYL ETHER, STABILIZED	3		II	Category B	
1305	VINYLTRICHLOROSILANE	3	8	II	Category B SW2	
1306	WOOD PRESERVATIVES, LIQUID	3		II	Category B	
1306	WOOD PRESERVATIVES, LIQUID	3		III	Category A	
1307	XYLENES	3		II	Category B	
1307	XYLENES	3		III	Category A	
1308	ZIRCONIUM, SUSPENDED IN A FLAMMABLE LIQUID	3		I	Category D	
1308	ZIRCONIUM, SUSPENDED IN A FLAMMABLE LIQUID	3		II	Category B	
1308	ZIRCONIUM, SUSPENDED IN A FLAMMABLE LIQUID	3		III	Category B	
1309	ALUMINIUM POWDER, COATED	4.1		II	Category A H1	SG17 SG32 SG35 SG36 SG52
1309	ALUMINIUM POWDER, COATED	4.1		III	Category A H1	SG17 SG32 SG35 SG36 SG52
1310	AMMONIUM PICRATE, WETTED with not less than 10% water, by mass	4.1		I	Category D	SG7 SG30
1312	BORNEOL	4.1		III	Category A	
1313	CALCIUM RESINATE	4.1		III	Category A	
1314	CALCIUM RESINATE, FUSED	4.1		III	Category A	
1318	COBALT RESINATE, PRECIPITATED	4.1		III	Category A	
1320	DINITROPHENOL, WETTED with not less than 15% water, by mass	4.1		I	Category E	SG7 SG30

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1321	DINITROPHENOLATES, WETTED with not less than 15% water, by mass	4.1	6.1P	I	Category E	SG7 SG30
1322	DINITRORESORCINOL, WETTED with not less than 15% water, by mass	4.1		I	Category E	SG7 SG30
1323	FERROCERIUM	4.1		II	Category A	
1324	FILMS, NITROCELLULOSE BASE gelatin coated, except scrap	4.1		III	Category D	SG7
1325	FLAMMABLE SOLID, ORGANIC, N.O.S.	4.1		II	Category B	
1325	FLAMMABLE SOLID, ORGANIC, N.O.S.	4.1		III	Category B	
1326	HAFNIUM POWDER, WETTED with not less than 25% water (a visible excess of water must be present) (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns	4.1		II	Category E	SG17
1327	HAY, STRAW or BHUSA	4.1			Category A SW10	SG23
1328	HEXAMETHYLENETETRAMINE	4.1		III	Category A	
1330	MANGANESE RESINATE	4.1		III	Category A	
1331	MATCHES, 'STRIKE ANYWHERE'	4.1		III	Category B	
1332	METALDEHYDE	4.1		III	Category A	
1333	CERIUM slabs, ingots or rods	4.1		II	Category A	SG15 SG17
1334	NAPHTHALENE, CRUDE or NAPHTHALENE, REFINED	4.1		III	Category A SW23	
1336	NITROGUANIDINE (PICRITE), WETTED with not less than 20% water, by mass	4.1		I	Category E	SG7 SG30
1337	NITROSTARCH, WETTED with not less than 20% water, by mass	4.1		I	Category D	SG7 SG30
1338	PHOSPHORUS, AMORPHOUS	4.1		III	Category A	SG17
1339	PHOSPHORUS HEPTASULPHIDE free from yellow or white phosphorus	4.1		II	Category B	SG17
1340	PHOSPHORUS PENTASULPHIDE free from yellow or white phosphorus	4.3		II	Category D	
1341	PHOSPHORUS SESQUISULPHIDE free from yellow or white phosphorus	4.1		II	Category B	SG17
1343	PHOSPHORUS TRISULPHIDE free from yellow or white phosphorus	4.1		II	Category B	SG17
1344	TRINITROPHENOL (PICRIC ACID), WETTED with not less than 30% water, by mass	4.1		I	Category E	SG7 SG30
1345	RUBBER SCRAP powdered or granulated, not exceeding 840 microns and rubber content exceeding 45% or RUBBER SHODDY powdered or granulated, not exceeding 840 microns and rubber content exceeding 45%	4.1		II	Category A	
1346	SILICON POWDER, AMORPHOUS	4.1		III	Category A	SG17
1347	SILVER PICRATE, WETTED with not less than 30% water, by mass	4.1		I	Category D	SG7 SG30
1348	SODIUM DINITRO-o-CRESOLATE, WETTED with not less than 15% water, by mass	4.1	6.1P	I	Category E	SG7 SG30
1349	SODIUM PICRAMATE, WETTED with not less than 20% water, by mass	4.1		I	Category E	SG7 SG30

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1350	SULPHUR	4.1		III	Category A SW1 SW23	SG17
1352	TITANIUM POWDER, WETTED with not less than 25% water (a visible excess of water must be present) (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns	4.1		II	Category E	SG17
1353	FIBRES or FABRICS IMPREGNATED WITH WEAKLY NITRATED NITROCELLULOSE, N.O.S.	4.1		III	Category D	
1354	TRINITROBENZENE, WETTED with not less than 30% water, by mass	4.1		I	Category E	SG7 SG30
1355	TRINITROBENZOIC ACID, WETTED with not less than 30% water, by mass	4.1		I	Category E	SG7 SG30
1356	TRINITROTOLUENE (TNT), WETTED with not less than 30% water, by mass	4.1		I	Category E	SG7 SG30
1357	UREA NITRATE, WETTED with not less than 20% water, by mass	4.1		I	Category E	SG7 SG30
1358	ZIRCONIUM POWDER, WETTED with not less than 25% water (a visible excess of water must be present) (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns	4.1		II	Category E	SG17
1360	CALCIUM PHOSPHIDE	4.3	6.1	I	Category E SW2 SW5	SG35
1361	CARBON animal or vegetable origin	4.2		II	Category A SW1 H2	
1361	CARBON animal or vegetable origin	4.2		III	Category A SW1 H2	
1362	CARBON, ACTIVATED	4.2		III	Category A SW1 H2	
1363	COPRA	4.2		III	Category A SW1 SW9 H1	
1364	COTTON WASTE, OILY	4.2		III	Category A	SG41
1365	COTTON, WET	4.2		III	Category A	
1369	p-NITROSODIMETHYLANILINE	4.2		II	Category D	SG29
1372	FIBRES ANIMAL or FIBRES VEGETABLE burnt, wet or damp	4.2		III	Category A	
1373	FIBRES or FABRICS, ANIMAL or VEGETABLE or SYNTHETIC N.O.S. with oil	4.2		III	Category A	
1374	FISHMEAL, UNSTABILIZED (FISHSCRAP, UNSTABILIZED) High hazard. Unrestricted moisture content, Unrestricted fat content in excess of 12%, by mass; unrestricted fat content in excess of 15%, by mass, in the case of antioxidant treated fishmeal or fishscrap	4.2		II	Category B SW1 SW24	SG65
1374	FISHMEAL, UNSTABILIZED (FISHSCRAP, UNSTABILIZED) High hazard Unrestricted moisture content, Unrestricted fat content in excess of 12%, by mass; unrestricted fat content in excess of 15%, by mass, in the case of antioxidant treated fishmeal or fishscrap	4.2		III	Category A SW1 SW24	
1376	IRON OXIDE, SPENT or IRON SPONGE, SPENT obtained from coal gas purification	4.2		III	Category E	

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1378	METAL CATALYST, WETTED with a visible excess of liquid	4.2		II	Category C	
1379	PAPER, UNSATURATED OIL TREATED incompletely dried (including carbon paper)	4.2		III	Category A	
1380	PENTABORANE	4.2	6.1	I	Category D	
1381	PHOSPHORUS, WHITE or YELLOW, DRY or UNDER WATER or IN SOLUTION	4.2	6.1P	I	Category E	
1382	POTASSIUM SULPHIDE, ANHYDROUS or POTASSIUM SULPHIDE with less than 30% water of crystall	4.2		II	Category A	SG35
1383	PYROPHORIC METAL, N.O.S. or PYROPHORIC ALLOY, N.O.S.	4.2		I	Category D	
1384	SODIUM DITHIONITE (SODIUM HYDROSULPHITE)	4.2		II	Category E H1	
1385	SODIUM SULPHIDE, ANHYDROUS or SODIUM SULPHIDE with less than 30% water of crystallizatio	4.2		II	Category A	SG35
1386	SEED CAKE, containing vegetable oil (a) mechanically expelled seeds, containing more tha	4.2		III	Category E SW1 SW25 H1	
1386	SEED CAKE, containing vegetable oil (b) solvent extractions and expelled seeds, containi	4.2		III	Category A SW1 SW25 H1	
1387	WOOL WASTE, WET	4.2		III	Category A	
1389	ALKALI METAL AMALGAM, LIQUID	4.3		I	Category D	SG35
1390	ALKALI METAL AMIDE	4.3		II	Category E SW2	SG35
1391	ALKALI METAL DISPERSION or ALKALINE EARTH METAL DISPERSION	4.3		I	Category D	SG35
1392	ALKALINE EARTH METAL AMALGAM, LIQUID	4.3		I	Category D	SG35
1393	ALKALINE EARTH METAL ALLOY, N.O.S.	4.3		II	Category E	SG35
1394	ALUMINIUM CARBIDE	4.3		II	Category A	SG35
1395	ALUMINIUM FERROSILICON POWDER	4.3	6.1	II	Category A SW2 SW5 H1	SG32 SG35 SG36
1396	ALUMINIUM POWDER, UNCOATED	4.3		II	Category A	SG32 SG35 SG36
1396	ALUMINIUM POWDER, UNCOATED	4.3		III	Category A	SG32 SG35 SG36
1397	ALUMINIUM PHOSPHIDE	4.3	6.1	I	Category E SW2 SW5	SG35
1398	ALUMINIUM SILICON POWDER, UNCOATED	4.3		III	Category A SW2 SW5 H1	SG32 SG35 SG36
1400	BARIUM	4.3		II	Category E	SG35
1401	CALCIUM	4.3		II	Category E	SG35
1402	CALCIUM CARBIDE	4.3		I	Category B	SG35
1402	CALCIUM CARBIDE	4.3		II	Category B	SG35
1403	CALCIUM CYANAMIDE with more than 0.1% calcium carbide	4.3		III	Category A	SG35
1404	CALCIUM HYDRIDE	4.3		I	Category E	SG35
1405	CALCIUM SILICIDE	4.3		II	Category B SW5 H1	SG35
1405	CALCIUM SILICIDE	4.3		III	Category B SW5 H1	SG35

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1407	CAESIUM	4.3		I	Category D	SG35
1408	FERROSILICON with 30% or more but less than 90% silicon	4.3	6.1	III	Category A SW2 SW5 H1	SG35 SG36
1409	METAL HYDRIDES, WATER-REACTIVE, N.O.S.	4.3		I	Category D	SG35
1409	METAL HYDRIDES, WATER-REACTIVE, N.O.S.	4.3		II	Category D	SG35
1410	LITHIUM ALUMINIUM HYDRIDE	4.3		I	Category E	SG35
1411	LITHIUM ALUMINIUM HYDRIDE, ETHEREAL	4.3	3	I	Category D SW2	
1413	LITHIUM BOROHYDRIDE	4.3		I	Category E	SG35
1414	LITHIUM HYDRIDE	4.3		I	Category E	SG35
1415	LITHIUM	4.3		I	Category E	SG35
1417	LITHIUM SILICON	4.3		II	Category A SW5 H1	
1418	MAGNESIUM POWDER or MAGNESIUM ALLOYS POWDER	4.3	4.2	I	Category A	SG32 SG35
1418	MAGNESIUM POWDER or MAGNESIUM ALLOYS POWDER	4.3	4.2	II	Category A	SG32 SG35
1418	MAGNESIUM POWDER or MAGNESIUM ALLOYS POWDER	4.3	4.2	III	Category A	SG32 SG35
1419	MAGNESIUM ALUMINIUM PHOSPHIDE	4.3	6.1	I	Category E SW2 SW5	SG35
1420	POTASSIUM METAL ALLOYS, LIQUID	4.3		I	Category D	SG35
1421	ALKALI METAL ALLOY, LIQUID, N.O.S.	4.3		I	Category D	SG35
1422	POTASSIUM SODIUM ALLOYS, LIQUID	4.3		I	Category D	SG35
1423	RUBIDIUM	4.3		I	Category D	SG35
1426	SODIUM BOROHYDRIDE	4.3		I	Category E	SG35
1427	SODIUM HYDRIDE	4.3		I	Category E	SG35
1428	SODIUM	4.3		I	Category D	SG35
1431	SODIUM METHYLATE	4.2	8	II	Category B	
1432	SODIUM PHOSPHIDE	4.3	6.1	I	Category E SW2 SW5	SG35
1433	STANNIC PHOSPHIDE	4.3	6.1	I	Category E SW2 SW5	SG35
1435	ZINC ASHES	4.3		III	Category A	
1436	ZINC POWDER or ZINC DUST	4.3	4.2	I	Category A	SG35 SG36
1436	ZINC POWDER or ZINC DUST	4.3	4.2	II	Category A	SG35 SG36
1436	ZINC POWDER or ZINC DUST	4.3	4.2	III	Category A	SG35 SG36
1437	ZIRCONIUM HYDRIDE	4.1		II	Category E	
1438	ALUMINIUM NITRATE	5.1		III	Category A	
1439	AMMONIUM DICHROMATE	5.1		II	Category A	SG35
1442	AMMONIUM PERCHLORATE	5.1		II	Category E	SG49 SG60
1444	AMMONIUM PERSULPHATE	5.1		III	Category A	

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1445	BARIUM CHLORATE, SOLID	5.1	6.1	II	Category A	SG38 SG49
1446	BARIUM NITRATE	5.1	6.1	II	Category A	
1447	BARIUM PERCHLORATE, SOLID	5.1	6.1	II	Category A	SG38 SG49
1448	BARIUM PERMANGANATE	5.1	6.1	II	Category D	SG38 SG49 SG60
1449	BARIUM PEROXIDE	5.1	6.1	II	Category A H1	SG16 SG35 SG59
1450	BROMATES, INORGANIC, N.O.S.	5.1		II	Category A	SG38 SG49
1451	CAESIUM NITRATE	5.1		III	Category A	
1452	CALCIUM CHLORATE	5.1		II	Category A	SG38 SG49
1453	CALCIUM CHLORITE	5.1		II	Category A	SG38 SG49
1454	CALCIUM NITRATE	5.1		III	Category A SW23	
1455	CALCIUM PERCHLORATE	5.1		II	Category A	SG38 SG49
1456	CALCIUM PERMANGANATE	5.1		II	Category D	SG38 SG49 SG60
1457	CALCIUM PEROXIDE	5.1		II	Category A H1	SG16 SG35 SG59
1458	CHLORATE AND BORATE MIXTURE	5.1		II	Category A	SG38 SG49
1458	CHLORATE AND BORATE MIXTURE	5.1		III	Category A	SG38 SG49
1459	CHLORATE AND MAGNESIUM CHLORIDE MIXTURE, SOLID	5.1		II	Category A	SG38 SG49
1459	CHLORATE AND MAGNESIUM CHLORIDE MIXTURE, SOLID	5.1		III	Category A	SG38 SG49
1461	CHLORATES, INORGANIC, N.O.S.	5.1		II	Category A	SG38 SG49
1462	CHLORITES, INORGANIC, N.O.S.	5.1		II	Category A	SG38 SG49
1463	CHROMIUM TRIOXIDE, ANHYDROUS	5.1	6.1/8	II	Category A	SG6 SG16 SG19
1465	DIDYMIUM NITRATE	5.1		III	Category A	
1466	FERRIC NITRATE	5.1		III	Category A	
1467	GUANIDINE NITRATE	5.1		III	Category A	SG45
1469	LEAD NITRATE	5.1	6.1P	II	Category A	
1470	LEAD PERCHLORATE, SOLID	5.1	6.1P	II	Category A	SG38 SG49
1471	LITHIUM HYPOCHLORITE, DRY or LITHIUM HYPOCHLORITE MIXTURE	5.1		II	Category A SW1 SW8	SG35 SG38 SG49 SG53 SG60

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1471	LITHIUM HYPOCHLORITE, DRY or LITHIUM HYPOCHLORITE MIXTURE	5.1		III	Category A SW1 SW8	SG35 SG38 SG49 SG53 SG60
1472	LITHIUM PEROXIDE	5.1		II	Category A H1	SG16 SG35 SG59
1473	MAGNESIUM BROMATE	5.1		II	Category A	SG38 SG49
1474	MAGNESIUM NITRATE	5.1		III	Category A SW23	
1475	MAGNESIUM PERCHLORATE	5.1		II	Category A	SG38 SG49
1476	MAGNESIUM PEROXIDE	5.1		II	Category A H1	SG16 SG35 SG59
1477	NITRATES, INORGANIC, N.O.S.	5.1		II	Category A	SG38 SG49
1477	NITRATES, INORGANIC, N.O.S.	5.1		III	Category A	SG38 SG49
1479	OXIDIZING SOLID, N.O.S.	5.1		I	Category D	SG38 SG49 SG60 SG61
1479	OXIDIZING SOLID, N.O.S.	5.1		II	Category B	SG38 SG49 SG60 SG61
1479	OXIDIZING SOLID, N.O.S.	5.1		III	Category B	SG38 SG49 SG60 SG61
1481	PERCHLORATES, INORGANIC, N.O.S.	5.1		II	Category A	SG38 SG49
1481	PERCHLORATES, INORGANIC, N.O.S.	5.1		III	Category A	SG38 SG49
1482	PERMANGANATES, INORGANIC, N.O.S.	5.1		II	Category D	SG38 SG49 SG60
1482	PERMANGANATES, INORGANIC, N.O.S.	5.1		III	Category D	SG38 SG49 SG60
1483	PEROXIDES, INORGANIC, N.O.S.	5.1		II	Category A H1	SG16 SG35 SG59
1483	PEROXIDES, INORGANIC, N.O.S.	5.1		III	Category A H1	SG16 SG35 SG59
1484	POTASSIUM BROMATE	5.1		II	Category A	SG38 SG49
1485	POTASSIUM CHLORATE	5.1		II	Category A	SG38 SG49
1486	POTASSIUM NITRATE	5.1		III	Category A SW23	
1487	POTASSIUM NITRATE AND SODIUM NITRITE MIXTURE	5.1		II	Category A	SG38 SG49
1488	POTASSIUM NITRITE	5.1		II	Category A	SG38 SG49
1489	POTASSIUM PERCHLORATE	5.1		II	Category A	SG38 SG49

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1490	POTASSIUM PERMANGANATE	5.1		II	Category D	SG38 SG49 SG60
1491	POTASSIUM PEROXIDE	5.1		I	Category B H1	SG16 SG35 SG59
1492	POTASSIUM PERSULPHATE	5.1		III	Category A	SG39 SG49
1493	SILVER NITRATE	5.1		II	Category A	
1494	SODIUM BROMATE	5.1		II	Category A	SG38 SG49
1495	SODIUM CHLORATE	5.1		II	Category A	SG38 SG49
1496	SODIUM CHLORITE	5.1		II	Category A	SG38 SG49
1498	SODIUM NITRATE	5.1		III	Category A SW23	
1499	SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE	5.1		III	Category A SW23	
1500	SODIUM NITRITE	5.1	6.1	III	Category A	SG38 SG49
1502	SODIUM PERCHLORATE	5.1		II	Category A	SG38 SG49
1503	SODIUM PERMANGANATE	5.1		II	Category D	SG38 SG49 SG60
1504	SODIUM PEROXIDE	5.1		I	Category B H1	SG16 SG35 SG59
1505	SODIUM PERSULPHATE	5.1		III	Category A	SG39 SG49
1506	STRONTIUM CHLORATE	5.1		II	Category A	SG38 SG49
1507	STRONTIUM NITRATE	5.1		III	Category A	
1508	STRONTIUM PERCHLORATE	5.1		II	Category A	SG38 SG49
1509	STRONTIUM PEROXIDE	5.1		II	Category A H1	SG16 SG35 SG59
1510	TETRANITROMETHANE	6.1	5.1	I	Category D SW2	SG16
1511	UREA HYDROGEN PEROXIDE	5.1	8	III	Category A H1	
1512	ZINC AMMONIUM NITRITE	5.1			Category	
1513	ZINC CHLORATE	5.1		II	Category A	SG38 SG49
1514	ZINC NITRATE	5.1		II	Category A	
1515	ZINC PERMANGANATE	5.1		II	Category D	SG38 SG49 SG60
1516	ZINC PEROXIDE	5.1		II	Category A H1	SG16 SG35 SG59
1517	ZIRCONIUM PICRAMATE, WETTED with not less than 20% water, by mass	4.1		I	Category D	SG7 SG30
1541	ACETONE CYANOHYDRIN, STABILIZED	6.1	P	I	Category D SW1 SW2	SG35 SG36

UN Number	PROPER SHIPPING NAME (Note: When there is more than one packing group or PSN the UN No. has been annotated with a, b, c)	Class or division	Subsidiary risk(s)	Packing Group	Stowage and Handling	Segregation
1544	ALKALOIDS, SOLID, N.O.S. or ALKALOIDS SALTS, SOLID, N.O.S.	6.1		I	Category A	
1544	ALKALOIDS, SOLID, N.O.S. or ALKALOIDS SALTS, SOLID, N.O.S.	6.1		II	Category A	
1544	ALKALOIDS, SOLID, N.O.S. or ALKALOIDS SALTS, SOLID, N.O.S.	6.1		III	Category A	
1545	ALLYL ISOTHIOCYANATE, STABILIZED	6.1	3	II	Category D SW2	
1546	AMMONIUM ARSENATE	6.1		II	Category A	SG36
1547	ANILINE	6.1		II	Category A SW2	SG35
1548	ANILINE HYDROCHLORIDE	6.1		III	Category A	
1549	ANTIMONY COMPOUND, INORGANIC, SOLID, N.O.S.	6.1		III	Category A	
1550	ANTIMONY LACTATE	6.1		III	Category A	
1551	ANTIMONY POTASSIUM TARTRATE	6.1		III	Category A	
1553	ARSENIC ACID, LIQUID	6.1		I	Category B	SG33
1554	ARSENIC ACID, SOLID	6.1		II	Category A	
1555	ARSENIC BROMIDE	6.1		II	Category A SW1 SW2 H2	
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		I	Category B SW2	SG70
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		II	Category B SW2	SG70
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		III	Category B SW2	SG70
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		I	Category A	SG70
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		II	Category A	SG70
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		III	Category A	SG70
1558	ARSENIC	6.1		II	Category A	
1559	ARSENIC PENTOXIDE	6.1		II	Category A	
1560	ARSENIC TRICHLORIDE	6.1		I	Category B SW2	
1561	ARSENIC TRIOXIDE	6.1		II	Category A	
1562	ARSENICAL DUST	6.1		II	Category A	
1564	BARIUM COMPOUND, N.O.S.	6.1		II	Category A	
1564	BARIUM COMPOUND, N.O.S.	6.1		III	Category A	
1565	BARIUM CYANIDE	6.1	P	I	Category A SW2	SG35
1566	BERYLLIUM COMPOUND, N.O.S.	6.1		II	Category A	

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1566	BERYLLIUM COMPOUND, N.O.S.	6.1		III	Category A	
1567	BERYLLIUM POWDER	6.1	4.1	II	Category A	
1569	BROMOACETONE	6.1	3P	II	Category D SW2	
1570	BRUCINE	6.1		I	Category A	
1571	BARIUM AZIDE, WETTED with not less than 50% water, by mass	4.1	6.1	I	Category D	SG7 SG30
1572	CACODYLIC ACID	6.1		II	Category E	SG35
1573	CALCIUM ARSENATE	6.1	P	II	Category A	
1574	CALCIUM ARSENATE AND CALCIUM ARSENITE MIXTURE, SOLID	6.1	P	II	Category A	
1575	CALCIUM CYANIDE	6.1	P	I	Category A SW2	SG35
1577	CHLORODINITROBENZENES, LIQUID	6.1	P	II	Category A	SG15
1578	CHLORONITROBENZENES, SOLID	6.1		II	Category A	
1579	4-CHLORO-o-TOLUIDINE HYDROCHLORIDE, SOLID	6.1		III	Category A	
1580	CHLOROPICRIN	6.1	P	I	Category D SW2	
1581	CHLOROPICRIN AND METHYL BROMIDE MIXTURE with more than 2% chloropicrin	2.3			Category D SW1 SW2	
1582	CHLOROPICRIN AND METHYL CHLORIDE MIXTURE	2.3			Category D SW1 SW2	
1583	CHLOROPICRIN MIXTURE, N.O.S.	6.1		I	Category C SW2	
1583	CHLOROPICRIN MIXTURE, N.O.S.	6.1		II	Category C SW2	
1583	CHLOROPICRIN MIXTURE, N.O.S.	6.1		III	Category C SW2	
1585	COPPER ACETOARSENITE	6.1	P	II	Category A	
1586	COPPER ARSENITE	6.1	P	II	Category A	
1587	COPPER CYANIDE	6.1	P	II	Category A	SG35
1588	CYANIDES, INORGANIC, SOLID, N.O.S.	6.1	P	I	Category A	SG35
1588	CYANIDES, INORGANIC, SOLID, N.O.S.	6.1	P	II	Category A	SG35
1588	CYANIDES, INORGANIC, SOLID, N.O.S.	6.1	P	III	Category A	SG35
1589	CYANOGEN CHLORIDE, STABILIZED	2.3	8P		Category D SW2	
1590	DICHLOROANILINES, LIQUID	6.1	P	II	Category A SW2	
1591	o-DICHLOROBENZENE	6.1		III	Category A	
1593	DICHLOROMETHANE	6.1		III	Category A	
1594	DIETHYL SULPHATE	6.1		II	Category C	
1595	DIMETHYL SULPHATE	6.1	8	I	Category D SW2	
1596	DINITROANILINES	6.1		II	Category A	SG15
1597	DINITROBENZENES, LIQUID	6.1		II	Category A	SG15
1597	DINITROBENZENES, LIQUID	6.1		III	Category A	SG15
1598	DINITRO-o-CRESOL	6.1	P	II	Category A	
1599	DINITROPHENOL SOLUTION	6.1	P	II	Category A	SG30

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1599	DINITROPHENOL SOLUTION	6.1	P	III	Category A	SG30
1600	DINITROTOLUENES, MOLTEN	6.1		II	Category C	
1601	DISINFECTANT, SOLID, TOXIC, N.O.S.	6.1		I	Category A SW2	
1601	DISINFECTANT, SOLID, TOXIC, N.O.S.	6.1		II	Category A SW2	
1601	DISINFECTANT, SOLID, TOXIC, N.O.S.	6.1		III	Category A SW2	
1602	DYE, LIQUID, TOXIC, N.O.S. or DYE INTERMEDIATE, LIQUID, TOXIC, N.O.S.	6.1		I	Category A	
1602	DYE, LIQUID, TOXIC, N.O.S. or DYE INTERMEDIATE, LIQUID, TOXIC, N.O.S.	6.1		II	Category A	
1602	DYE, LIQUID, TOXIC, N.O.S. or DYE INTERMEDIATE, LIQUID, TOXIC, N.O.S.	6.1		III	Category A	
1603	ETHYL BROMOACETATE	6.1	3	II	Category D SW2	
1604	ETHYLENEDIAMINE	8	3	II	Category A SW2	SG35
1605	ETHYLENE DIBROMIDE	6.1		I	Category D SW2	
1606	FERRIC ARSENATE	6.1	P	II	Category A	
1607	FERRIC ARSENITE	6.1	P	II	Category A	
1608	FERROUS ARSENATE	6.1	P	II	Category A	
1611	HEXAETHYL TETRAPHOSPHATE	6.1	P	II	Category E SW2	
1612	HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE	2.3			Category D SW2	
1613	HYDROCYANIC ACID, AQUEOUS SOLUTION (HYDROGEN CYANIDE, AQUEOUS SOLUTION) with not more th	6.1	P	I	Category D SW2	
1614	HYDROGEN CYANIDE, STABILIZED containing less than 3% water and absorbed in a porous iner	6.1	P	I	Category D SW1 SW2	
1616	LEAD ACETATE	6.1	P	III	Category A	
1617	LEAD ARSENATES	6.1	P	II	Category A	
1618	LEAD ARSENITES	6.1	P	II	Category A	
1620	LEAD CYANIDE	6.1	P	II	Category A	SG35
1621	LONDON PURPLE	6.1	P	II	Category A	
1622	MAGNESIUM ARSENATE	6.1	P	II	Category A	
1623	MERCURIC ARSENATE	6.1	P	II	Category A	
1624	MERCURIC CHLORIDE	6.1	P	II	Category A	
1625	MERCURIC NITRATE	6.1	P	II	Category A	
1626	MERCURIC POTASSIUM CYANIDE	6.1	P	I	Category A	SG35
1627	MERCUROUS NITRATE	6.1	P	II	Category A	
1629	MERCURY ACETATE	6.1	P	II	Category A	
1630	MERCURY AMMONIUM CHLORIDE	6.1	P	II	Category A	
1631	MERCURY BENZOATE	6.1	P	II	Category A	
1634	MERCURY BROMIDES	6.1	P	II	Category A	
1636	MERCURY CYANIDE	6.1	P	II	Category A	SG35

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1637	MERCURY GLUCONATE	6.1	P	II	Category A	
1638	MERCURY IODIDE	6.1	P	II	Category A	
1639	MERCURY NUCLEATE	6.1	P	II	Category A	
1640	MERCURY OLEATE	6.1	P	II	Category A	
1641	MERCURY OXIDE	6.1	P	II	Category A	
1642	MERCURY OXYCYANIDE, DESENSITIZED	6.1	P	II	Category A	SG15 SG35
1643	MERCURY POTASSIUM IODIDE	6.1	P	II	Category A	
1644	MERCURY SALICYLATE	6.1	P	II	Category A	
1645	MERCURY SULPHATE	6.1	P	II	Category A	
1646	MERCURY THIOCYANATE	6.1	P	II	Category A	
1647	METHYL BROMIDE AND ETHYLENE DIBROMIDE MIXTURE, LIQUID	6.1	P	I	Category D SW2	
1648	ACETONITRILE	3		II	Category B SW2	
1649	MOTOR FUEL ANTI-KNOCK MIXTURE	6.1	P	I	Category D SW1 SW2	
1650	beta-NAPHTHYLAMINE, SOLID	6.1		II	Category A	
1651	NAPHTHYLTHIOUREA	6.1		II	Category A	
1652	NAPHTHYLUREA	6.1		II	Category A	
1653	NICKEL CYANIDE	6.1	P	II	Category A	SG35
1654	NICOTINE	6.1		II	Category A	
1655	NICOTINE COMPOUND, SOLID, N.O.S. or NICOTINE PREPARATION, SOLID, N.O.S.	6.1		I	Category B	
1655	NICOTINE COMPOUND, SOLID, N.O.S. or NICOTINE PREPARATION, SOLID, N.O.S.	6.1		II	Category A	
1655	NICOTINE COMPOUND, SOLID, N.O.S. or NICOTINE PREPARATION, SOLID, N.O.S.	6.1		III	Category A	
1656	NICOTINE HYDROCHLORIDE, LIQUID or SOLUTION	6.1		II	Category A	
1656	NICOTINE HYDROCHLORIDE, LIQUID or SOLUTION	6.1		III	Category A	
1657	NICOTINE SALICYLATE	6.1		II	Category A	
1658	NICOTINE SULPHATE SOLUTION	6.1		II	Category A	
1658	NICOTINE SULPHATE SOLUTION	6.1		III	Category A	
1659	NICOTINE TARTRATE	6.1		II	Category A	
1660	NITRIC OXIDE, COMPRESSED	2.3	5.1/8		Category D SW2	SG6 SG19
1661	NITROANILINES (o-, m-, p-)	6.1		II	Category A	
1662	NITROBENZENE	6.1		II	Category A SW2	
1663	NITROPHENOLS (o-, m-, p-)	6.1		III	Category A	
1664	NITROTOLUENES, LIQUID	6.1		II	Category A	
1665	NITROXYLENES, LIQUID	6.1		II	Category A	
1669	PENTACHLOROETHANE	6.1	P	II	Category A SW2	
1670	PERCHLOROMETHYL MERCAPTAN	6.1	P	I	Category D SW2	
1671	PHENOL, SOLID	6.1		II	Category A	

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1672	PHENYLCARBYLAMINE CHLORIDE	6.1		I	Category D SW2	
1673	PHENYLENEDIAMINES (o-, m-, p-)	6.1		III	Category A	
1674	PHENYLMERCURIC ACETATE	6.1	P	II	Category A	
1677	POTASSIUM ARSENATE	6.1		II	Category A	
1678	POTASSIUM ARSENITE	6.1		II	Category A	
1679	POTASSIUM CUPROCYANIDE	6.1	P	II	Category A	SG35
1680	POTASSIUM CYANIDE, SOLID	6.1	P	I	Category B	SG35
1683	SILVER ARSENITE	6.1	P	II	Category A	
1684	SILVER CYANIDE	6.1	P	II	Category A SW2	SG35
1685	SODIUM ARSENATE	6.1		II	Category A	
1686	SODIUM ARSENITE, AQUEOUS SOLUTION	6.1		II	Category A	
1686	SODIUM ARSENITE, AQUEOUS SOLUTION	6.1		III	Category A	
1687	SODIUM AZIDE	6.1		II	Category A	SG15 SG30 SG35
1688	SODIUM CACODYLATE	6.1		II	Category A	SG35
1689	SODIUM CYANIDE, SOLID	6.1	P	I	Category B	SG35
1690	SODIUM FLUORIDE, SOLID	6.1		III	Category A	SG35
1691	STRONTIUM ARSENITE	6.1		II	Category A	
1692	STRYCHNINE or STRYCHNINE SALTS	6.1	P	I	Category A	
1693	TEAR GAS SUBSTANCE, LIQUID, N.O.S.	6.1		I	Category D SW2	
1693	TEAR GAS SUBSTANCE, LIQUID, N.O.S.	6.1		II	Category D SW2	
1694	BROMOBENZYL CYANIDES, LIQUID	6.1		I	Category D SW1 SW2 H2	SG35
1695	CHLOROACETONE, STABILIZED	6.1	"3/8P	I	Category D SW2	SG5 SG8
1697	CHLOROACETOPHENONE, SOLID	6.1		II	Category D SW1 SW2 H2	
1698	DIPHENYLAMINE CHLOROARSINE	6.1	P	I	Category D SW2	
1699	DIPHENYLCHLOROARSINE, LIQUID	6.1	P	I	Category D SW2	
1700	TEAR GAS CANDLES	6.1	4.1	II	Category D SW2	
1701	XYLYL BROMIDE, LIQUID	6.1		II	Category D SW2	
1702	1,1,2,2-TETRACHLOROETHANE	6.1	P	II	Category A SW2	
1704	TETRAETHYL DITHIOPYROPHOSPHATE	6.1	P	II	Category D SW2	
1707	THALLIUM COMPOUND, N.O.S.	6.1	P	II	Category A	
1708	TOLUIDINES, LIQUID	6.1		II	Category A	
1709	2,4-TOLUYLENEDIAMINE, SOLID	6.1		III	Category A	
1710	TRICHLOROETHYLENE	6.1		III	Category A SW2	

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1711	XYLIDINES, LIQUID	6.1		II	Category A	
1712	ZINC ARSENATE or ZINC ARSENITE or ZINC ARSENATE, ZINC ARSENITE MIXTURE	6.1		II	Category A	
1713	ZINC CYANIDE	6.1	P	I	Category A	SG35
1714	ZINC PHOSPHIDE	4.3	6.1	I	Category E SW2 SW5	SG35
1715	ACETIC ANHYDRIDE	8	3	II	Category A SW2	
1716	ACETYL BROMIDE	8		II	Category C SW2	
1717	ACETYL CHLORIDE	3	8	II	Category B SW2	
1718	BUTYL ACID PHOSPHATE	8		III	Category A	
1719	CAUSTIC ALKALI LIQUID, N.O.S.	8		II	Category A	SG22 SG35
1719	CAUSTIC ALKALI LIQUID, N.O.S.	8		III	Category A	SG22 SG35
1722	ALLYL CHLOROFORMATE	6.1	"3/8	I	Category D SW2	SG5 SG8
1723	ALLYL IODIDE	3	8	II	Category B SW2	
1724	ALLYLTRICHLOROSILANE, STABILIZED	8	3	II	Category C SW2	
1725	ALUMINIUM BROMIDE, ANHYDROUS	8		II	Category A SW2	
1726	ALUMINIUM CHLORIDE, ANHYDROUS	8		II	Category A SW2	
1727	AMMONIUM HYDROGENDIFLUORIDE, SOLID	8		II	Category A SW1 SW2	SG35
1728	AMYLTRICHLOROSILANE	8		II	Category C SW2	
1729	ANISOYL CHLORIDE	8		II	Category C SW2	
1730	ANTIMONY PENTACHLORIDE, LIQUID	8		II	Category C SW2	
1731	ANTIMONY PENTACHLORIDE SOLUTION	8		II	Category C SW2	
1731	ANTIMONY PENTACHLORIDE SOLUTION	8		III	Category C SW2	
1732	ANTIMONY PENTAFLUORIDE	8	6.1	II	Category D SW2	SG6 SG8 SG10 SG12
1733	ANTIMONY TRICHLORIDE	8		II	Category C SW2	
1736	BENZOYL CHLORIDE	8		II	Category C SW2	
1737	BENZYL BROMIDE	6.1		II	Category D SW2 H1	
1738	BENZYL CHLORIDE	6.1	8	II	Category D SW2 H1	
1739	BENZYL CHLOROFORMATE	8	P	I	Category D SW2	

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1740	HYDROGENDIFLUORIDES, SOLID, N.O.S.	8		II	Category A SW1 SW2	SG35
1740	HYDROGENDIFLUORIDES, SOLID, N.O.S.	8		III	Category A SW1 SW2	SG35
1741	BORON TRICHLORIDE	2.3	8		Category D SW1 SW2	
1742	BORON TRIFLUORIDE ACETIC ACID COMPLEX, LIQUID	8		II	Category A	
1743	BORON TRIFLUORIDE PROPIONIC ACID COMPLEX, LIQUID	8		II	Category A	
1744	BROMINE or BROMINE SOLUTION	8	6.1	I	Category D SW1 SW2 H2	SG6 SG16 SG17 SG19
1745	BROMINE PENTAFLUORIDE	5.1	6.1/8	I	Category D SW1 SW2	SG6 SG16 SG19
1746	BROMINE TRIFLUORIDE	5.1	6.1/8	I	Category D SW1 SW2	SG6 SG16 SG19
1747	BUTYLTRICHLOROSILANE	8	3	II	Category C SW2	
1748	CALCIUM HYPOCHLORITE, DRY or CALCIUM HYPOCHLORITE MIXTURE, DRY with more than 39% available chlorine (8.8% available oxygen)	5.1		II	Category D SW1 SW11	SG35 SG38 SG49 SG53 SG60
1748	CALCIUM HYPOCHLORITE, DRY or CALCIUM HYPOCHLORITE MIXTURE, DRY with more than 39% available chlorine (8.8% available oxygen)	5.1		III	Category D SW1 SW11	SG35 SG38 SG49 SG53 SG60
1749	CHLORINE TRIFLUORIDE	2.3	5.1/8		Category D SW2	SG6 SG19
1750	CHLOROACETIC ACID SOLUTION	6.1	8	II	Category C SW2	
1751	CHLOROACETIC ACID, SOLID	6.1	8	II	Category C SW2	
1752	CHLOROACETYL CHLORIDE	6.1	8	I	Category D SW2	
1753	CHLOROPHENYLTRICHLOROSILANE	8	P	II	Category C SW2	
1754	CHLOROSULPHONIC ACID (with or without sulphur trioxide)	8		I	Category C SW2	
1755	CHROMIC ACID SOLUTION	8		II	Category C SW2	SG6 SG8 SG10 SG12
1755	CHROMIC ACID SOLUTION	8		III	Category C SW2	SG6 SG8 SG10 SG12
1756	CHROMIC FLUORIDE, SOLID	8		II	Category A	SG35
1757	CHROMIC FLUORIDE SOLUTION	8		II	Category A	
1757	CHROMIC FLUORIDE SOLUTION	8		III	Category A	
1758	CHROMIUM OXYCHLORIDE	8		I	Category C SW2	SG6 SG16 SG17 SG19

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1759	CORROSIVE SOLID, N.O.S.	8		I	Category B	
1759	CORROSIVE SOLID, N.O.S.	8		II	Category A	
1759	CORROSIVE SOLID, N.O.S.	8		III	Category A	
1760	CORROSIVE LIQUID, N.O.S.	8		I	Category B SW2	
1760	CORROSIVE LIQUID, N.O.S.	8		II	Category B SW2	
1760	CORROSIVE LIQUID, N.O.S.	8		III	Category A SW2	
1761	CUPRIETHYLENEDIAMINE SOLUTION	8	6.1 P	II	Category A	
1761	CUPRIETHYLENEDIAMINE SOLUTION	8	6.1 P	III	Category A	
1762	CYCLOHEXENYLTRICHLOROSILANE	8		II	Category C SW2	
1763	CYCLOHEXYLTRICHLOROSILANE	8		II	Category C SW2	
1764	DICHLOROACETIC ACID	8		II	Category A	
1765	DICHLOROACETYL CHLORIDE	8		II	Category D SW2	
1766	DICHLOROPHENYLTRICHLOROSILANE	8	P	II	Category C SW2	
1767	DIETHYLDICHLOROSILANE	8	3	II	Category C SW2	
1768	DIFLUOROPHOSPHORIC ACID, ANHYDROUS	8		II	Category A SW2	
1769	DIPHENYLDICHLOROSILANE	8		II	Category C SW2	
1770	DIPHENYLMETHYL BROMIDE	8		II	Category D SW2	
1771	DODECYLTRICHLOROSILANE	8		II	Category C SW2	
1773	FERRIC CHLORIDE, ANHYDROUS	8		III	Category A	
1774	FIRE EXTINGUISHER CHARGES corrosive liquid	8		II	Category A	
1775	FLUOROBORIC ACID	8		II	Category A	
1776	FLUOROPHOSPHORIC ACID, ANHYDROUS	8		II	Category A	
1777	FLUOROSULPHONIC ACID	8		I	Category D SW2	
1778	FLUOROSILICIC ACID	8		II	Category A	
1779	FORMIC ACID with more than 85% acid, by mass	8	3	II	Category A SW2	
1780	FUMARYL CHLORIDE	8		II	Category C SW2	
1781	HEXADECYLTRICHLOROSILANE	8		II	Category C SW2	
1782	HEXAFLUOROPHOSPHORIC ACID	8		II	Category A	
1783	HEXAMETHYLENEDIAMINE SOLUTION	8		II	Category A	
1783	HEXAMETHYLENEDIAMINE SOLUTION	8		III	Category A	
1784	HEXYLTRICHLOROSILANE	8		II	Category C SW2	
1786	HYDROFLUORIC ACID AND SULPHURIC ACID MIXTURE	8	6.1	I	Category D SW2	
1787	HYDRIODIC ACID	8		II	Category C	

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1787	HYDRIODIC ACID	8		III	Category C	
1788	HYDROBROMIC ACID	8		II	Category C	
1788	HYDROBROMIC ACID	8		III	Category C	
1789	HYDROCHLORIC ACID	8		II	Category C	
1789	HYDROCHLORIC ACID	8		III	Category C	
1790	HYDROFLUORIC ACID solution, with more than 60% hydrogen fluoride	8	6.1	I	Category D SW1 SW2 H2	
1790	HYDROFLUORIC ACID solution, with not more than 60% hydrogen fluoride	8	6.1	II	Category D SW1 SW2 H2	
1791	HYPOCHLORITE SOLUTION	8		II	Category B	SG20
1791	HYPOCHLORITE SOLUTION	8		III	Category B	SG20
1792	IODINE MONOCHLORIDE	8		II	Category D SW2	SG6 SG16 SG17 SG19
1793	ISOPROPYL ACID PHOSPHATE	8		III	Category A	
1794	LEAD SULPHATE with more than 3% free acid	8		II	Category A	
1796	NITRATING ACID MIXTURE with more than 50% nitric acid	8	5.1	I	Category D SW2	SG16
1796	NITRATING ACID MIXTURE with not more than 50% nitric acid	8		II	Category D SW2	
1798	NITROHYDROCHLORIC ACID	8		I	Category D SW2	SG6 SG16 SG17 SG19
1799	NONYLTRICHLOROSILANE	8		II	Category C SW2	
1800	OCTADECYLTRICHLOROSILANE	8		II	Category C SW2	
1801	OCTYLTRICHLOROSILANE	8		II	Category C SW2	
1802	PERCHLORIC ACID with not more than 50% acid, by mass	8	5.1	II	Category C	SG16
1803	PHENOLSULPHONIC ACID, LIQUID	8		II	Category C SW15	
1804	PHENYLTRICHLOROSILANE	8		II	Category C SW2	
1805	PHOSPHORIC ACID SOLUTION	8		III	Category A	
1806	PHOSPHORUS PENTACHLORIDE	8		II	Category C SW2	SG6 SG8 SG10 SG12
1807	PHOSPHORUS PENTOXIDE	8		II	Category A	
1808	PHOSPHORUS TRIBROMIDE	8		II	Category C SW2	
1809	PHOSPHORUS TRICHLORIDE	6.1	8	I	Category D SW2	
1810	PHOSPHORUS OXYCHLORIDE	6.1	8	I	Category D SW2	
1811	POTASSIUM HYDROGEN DIFLUORIDE, SOLID	8	6.1	II	Category A SW1 SW2	SG35
1812	POTASSIUM FLUORIDE, SOLID	6.1		III	Category A	SG35
1813	POTASSIUM HYDROXIDE, SOLID	8		II	Category A	SG35

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1814	POTASSIUM HYDROXIDE SOLUTION	8		II	Category A	SG35
1814	POTASSIUM HYDROXIDE SOLUTION	8		III	Category A	SG35
1815	PROPIONYL CHLORIDE	3	8	II	Category B SW2	
1816	PROPYLTRICHLOROSILANE	8	3	II	Category C SW2	
1817	PYROSULPHURYL CHLORIDE	8		II	Category C SW2	
1818	SILICON TETRACHLORIDE	8		II	Category C SW2	SG72
1819	SODIUM ALUMINATE SOLUTION	8		II	Category A	SG35
1819	SODIUM ALUMINATE SOLUTION	8		III	Category A	SG35
1823	SODIUM HYDROXIDE, SOLID	8		II	Category A	SG35
1824	SODIUM HYDROXIDE SOLUTION	8		II	Category A	SG35
1824	SODIUM HYDROXIDE SOLUTION	8		III	Category A	SG35
1825	SODIUM MONOXIDE	8		II	Category A	SG35
1826	NITRATING ACID MIXTURE, SPENT with more than 50% nitric acid	8	5.1	I	Category D SW2	SG16
1826	NITRATING ACID MIXTURE, SPENT with not more than 50% nitric acid	8		II	Category D SW2	
1827	STANNIC CHLORIDE, ANHYDROUS	8		II	Category C	
1828	SULPHUR CHLORIDES	8		I	Category C SW2	
1829	SULPHUR TRIOXIDE, STABILIZED	8		I	Category C SW2	
1830	SULPHURIC ACID with more than 51% acid	8		II	Category C SW15	
1831	SULPHURIC ACID, FUMING	8	6.1	I	Category C SW2 SW15	
1832	SULPHURIC ACID, SPENT	8		II	Category C SW15	
1833	SULPHUROUS ACID	8		II	Category B SW2	
1834	SULPHURYL CHLORIDE	6.1	8	I	Category D SW2	
1835	TETRAMETHYLAMMONIUM HYDROXIDE SOLUTION	8		II	Category A	SG35
1835	TETRAMETHYLAMMONIUM HYDROXIDE SOLUTION	8		III	Category A	SG35
1836	THIONYL CHLORIDE	8		I	Category C SW2	
1837	THIOPHOSPHORYL CHLORIDE	8		II	Category C SW2	
1838	TITANIUM TETRACHLORIDE	6.1	8	I	Category D SW2	
1839	TRICHLOROACETIC ACID, SOLID	8		II	Category A	
1840	ZINC CHLORIDE SOLUTION	8		III	Category A	
1841	ACETALDEHYDE AMMONIA	9		III	Category A	SG29
1843	AMMONIUM DINITRO-o-CRESOLATE, SOLID	6.1	P	II	Category B	SG15 SG16 SG30 SG63
1845	CARBON DIOXIDE, SOLID (DRY ICE)	9			Category C SW2	

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1846	CARBON TETRACHLORIDE	6.1	P	II	Category A SW2	
1847	POTASSIUM SULPHIDE, HYDRATED with not less than 30% water of crystallization	8		II	Category A	SG35
1848	PROPIONIC ACID with not less than 10% and less than 90% acid, by mass	8		III	Category A	
1849	SODIUM SULPHIDE, HYDRATED with not less than 30% water	8		II	Category A	SG35
1851	MEDICINE, LIQUID, TOXIC, N.O.S.	6.1		II	Category C SW2	
1851	MEDICINE, LIQUID, TOXIC, N.O.S.	6.1		III	Category C SW2	
1854	BARIUM ALLOYS, PYROPHORIC	4.2		I	Category D	
1855	CALCIUM, PYROPHORIC or CALCIUM ALLOYS, PYROPHORIC	4.2		I	Category D	
1856	RAGS, OILY	4.2			Category A	
1857	TEXTILE WASTE, WET	4.2		III	Category A	
1858	HEXAFLUOROPROPYLENE (REFRIGERANT GAS R 1216)	2.2			Category A	
1859	SILICON TETRAFLUORIDE	2.3	8		Category D SW2	
1860	VINYL FLUORIDE, STABILIZED	2.1			Category E SW2	
1862	ETHYL CROTONATE	3		II	Category B	
1863	FUEL, AVIATION, TURBINE ENGINE	3		I	Category E	
1863	FUEL, AVIATION, TURBINE ENGINE	3		II	Category B	
1863	FUEL, AVIATION, TURBINE ENGINE	3		III	Category A	
1865	n-PROPYL NITRATE	3		II	Category D	SG6 SG8 SG10 SG12
1866	RESIN SOLUTION flammable	3		I	Category E	
1866	RESIN SOLUTION flammable	3		II	Category B	
1866	RESIN SOLUTION flammable	3		III	Category A	
1868	DECABORANE	4.1	6.1	II	Category A	SG17
1869	MAGNESIUM or MAGNESIUM ALLOYS with more than 50% magnesium in pellets, turnings or ribbons	4.1		III	Category A	SG17 SG32 SG35 SG36 SG52
1870	POTASSIUM BOROHYDRIDE	4.3		I	Category E	SG35
1871	TITANIUM HYDRIDE	4.1		II	Category E	
1872	LEAD DIOXIDE	5.1		III	Category A	
1873	PERCHLORIC ACID with more than 50% but not more than 72% acid, by mass	5.1	8	I	Category D	SG16
1884	BARIUM OXIDE	6.1		III	Category A	
1885	BENZIDINE	6.1		II	Category A	
1886	BENZYLIDENE CHLORIDE	6.1		II	Category D SW2	
1887	BROMOCHLOROMETHANE	6.1		III	Category A	
1888	CHLOROFORM	6.1		III	Category A SW2	

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1889	CYANOGEN BROMIDE	6.1	8P	I	Category D SW2	SG35
1891	ETHYL BROMIDE	6.1		II	Category B SW2 SW5	
1892	ETHYLDICHLOROARSINE	6.1	P	I	Category D SW2	
1894	PHENYLMERCURIC HYDROXIDE	6.1	P	II	Category A	
1895	PHENYLMERCURIC NITRATE	6.1	P	II	Category A	
1897	TETRACHLOROETHYLENE	6.1	P	III	Category A SW2	
1898	ACETYL IODIDE	8		II	Category C SW2	
1902	DIISOOCTYL ACID PHOSPHATE	8		III	Category A	
1903	DISINFECTANT, LIQUID, CORROSIVE, N.O.S.	8		I	Category B	
1903	DISINFECTANT, LIQUID, CORROSIVE, N.O.S.	8		II	Category B	
1903	DISINFECTANT, LIQUID, CORROSIVE, N.O.S.	8		III	Category A	
1905	SELENIC ACID	8		I	Category A	
1906	SLUDGE ACID	8		II	Category C SW15	
1907	SODA LIME with more than 4% sodium hydroxide	8		III	Category A	SG35
1908	CHLORITE SOLUTION	8		II	Category B	SG6 SG8 SG10 SG12 SG20
1908	CHLORITE SOLUTION	8		III	Category B	SG6 SG8 SG10 SG12 SG20
1910	CALCIUM OXIDE	8			-	
1911	DIBORANE	2.3	2.1		Category D SW2	SG46
1912	METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	2.1			Category D SW2	
1913	NEON, REFRIGERATED LIQUID	2.2			Category D	
1914	BUTYL PROPIONATES	3		III	Category A	
1915	CYCLOHEXANONE	3		III	Category A	
1916	2,2'-DICHLORODIETHYL ETHER	6.1	3	II	Category A	
1917	ETHYL ACRYLATE, STABILIZED	3		II	Category B SW2	
1918	ISOPROPYLBENZENE	3		III	Category A	
1919	METHYL ACRYLATE, STABILIZED	3		II	Category B	
1920	NONANES	3		III	Category A	
1921	PROPYLENEIMINE, STABILIZED	3	6.1	I	Category B SW2	
1922	PYRROLIDINE	3	8	II	Category B SW2	SG35
1923	CALCIUM DITHIONITE (CALCIUM HYDROSULPHITE)	4.2		II	Category E H1	
1928	METHYLMAGNESIUM BROMIDE IN ETHYL ETHER	4.3	3	I	Category D	
1929	POTASSIUM DITHIONITE (POTASSIUM HYDROSULPHITE)	4.2		II	Category E H1	

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1931	ZINC DITHIONITE (ZINC HYDROSULPHITE)	9		III	Category A H1	SG11 SG20
1932	ZIRCONIUM, SCRAP	4.2		III	Category D	
1935	CYANIDE SOLUTION, N.O.S.	6.1	P	I	Category B SW2	SG35
1935	CYANIDE SOLUTION, N.O.S.	6.1	P	II	Category A SW2	SG35
1935	CYANIDE SOLUTION, N.O.S.	6.1	P	III	Category A SW2	SG35
1938	BROMOACETIC ACID SOLUTION	8		II	Category A SW2	
1938	BROMOACETIC ACID SOLUTION	8		III	Category A SW2	
1939	PHOSPHORUS OXYBROMIDE, SOLID	8		II	Category C SW1 SW2 H2	
1940	THIOGLYCOLIC ACID	8		II	Category A	
1941	DIBROMODIFLUOROMETHANE	9		III	Category A SW1	
1942	AMMONIUM NITRATE with not more than 0.2% total combustible material, including any organ	5.1		III	Category C SW1 SW14 SW23	SG16 SG42 SG45 SG47 SG48 SG51 SG56 SG58 SG59 SG61
1944	MATCHES, SAFETY (book, card or strike on box)	4.1		III	Category A	
1945	MATCHES, WAX 'VESTA'	4.1		III	Category B	
1950	AEROSOLS	2	SP63		- SW1 SW22	SG69
1951	ARGON, REFRIGERATED LIQUID	2.2			Category D	
1952	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with not more than 9% ethylene oxide	2.2			Category A	
1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.	2.3	2.1		Category D SW2	
1954	COMPRESSED GAS, FLAMMABLE, N.O.S.	2.1			Category D SW2	
1955	COMPRESSED GAS, TOXIC, N.O.S.	2.3			Category D SW2	
1956	COMPRESSED GAS, N.O.S.	2.2			Category A	
1957	DEUTERIUM, COMPRESSED	2.1			Category E SW2	
1958	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 114)	2.2			Category A	
1959	1,1-DIFLUOROETHYLENE (REFRIGERANT GAS R 1132a)	2.1			Category E SW2	
1961	ETHANE, REFRIGERATED LIQUID	2.1			Category D SW2	
1962	ETHYLENE	2.1			Category E SW2	
1963	HELIUM, REFRIGERATED LIQUID	2.2			Category D	

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1964	HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S.	2.1			Category E SW2	
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.	2.1			Category E SW2	
1966	HYDROGEN, REFRIGERATED LIQUID	2.1			Category D SW2	SG46
1967	INSECTICIDE GAS, TOXIC, N.O.S.	2.3			Category D SW2	
1968	INSECTICIDE GAS, N.O.S.	2.2			Category A	
1969	ISOBUTANE	2.1			Category E SW2	
1970	KRYPTON, REFRIGERATED LIQUID	2.2			Category D	
1971	METHANE, COMPRESSED or NATURAL GAS, COMPRESSED with high methane content	2.1			Category E SW2	
1972	METHANE, REFRIGERATED LIQUID or NATURAL GAS, REFRIGERATED LIQUID with high methane conte	2.1			Category D SW2	
1973	CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE with a fixed boiling point, with approximately 49% chlorodifluoromethane (REFRIGERANT GAS R 502)	2.2			Category A	
1974	CHLORODIFLUOROBROMOMETHANE (REFRIGERANT GAS R 12B1)	2.2			Category A	
1975	NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURE (NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURE	2.3			Category D SW2	SG6 SG19
1976	OCTAFLUOROCYCLOBUTANE (REFRIGERANT GAS RC 318)	2.2			Category A	
1977	NITROGEN, REFRIGERATED LIQUID	2.2			Category D	
1978	PROPANE	2.1			Category E SW2	
1982	TETRAFLUOROMETHANE (REFRIGERANT GAS R 14)	2.2			Category A	
1983	1-CHLORO-2,2,2-TRIFLUOROETHANE (REFRIGERANT GAS R 133a)	2.2			Category A	
1984	TRIFLUOROMETHANE (REFRIGERANT GAS R 23)	2.2			Category A	
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	6.1	I	Category E SW2	
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	6.1	II	Category B SW2	
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	6.1	III	Category A	
1987	ALCOHOLS, N.O.S.	3		II	Category B	
1987	ALCOHOLS, N.O.S.	3		III	Category A	
1988	ALDEHYDES, FLAMMABLE, TOXIC, N.O.S.	3	6.1	I	Category E SW2	
1988	ALDEHYDES, FLAMMABLE, TOXIC, N.O.S.	3	6.1	II	Category B SW2	
1988	ALDEHYDES, FLAMMABLE, TOXIC, N.O.S.	3	6.1	III	Category A	
1989	ALDEHYDES, N.O.S.	3		I	Category E	
1989	ALDEHYDES, N.O.S.	3		II	Category B	
1989	ALDEHYDES, N.O.S.	3		III	Category A	
1990	BENZALDEHYDE	9		III	Category A	

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1991	CHLOROPRENE, STABILIZED	3	6.1	I	Category D SW2	
1992	FLAMMABLE LIQUID, TOXIC, N.O.S.	3	6.1	I	Category E SW2	
1992	FLAMMABLE LIQUID, TOXIC, N.O.S.	3	6.1	II	Category B SW2	
1992	FLAMMABLE LIQUID, TOXIC, N.O.S.	3	6.1	III	Category A	
1993	FLAMMABLE LIQUID, N.O.S.	3		I	Category E	
1993	FLAMMABLE LIQUID, N.O.S.	3		II	Category B	
1993	FLAMMABLE LIQUID, N.O.S.	3		III	Category A	
1994	IRON PENTACARBONYL	6.1	3	I	Category D SW2	
1999	TARS, LIQUID, including road oils and cutback bitumens	3		II	Category B	
1999	TARS, LIQUID, including road oils and cutback bitumens	3		III	Category A	
2000	CELLULOID in block, rods, rolls, sheets, tubes, etc., except scrap	4.1		III	Category A	
2001	COBALT NAPHTHENATES, POWDER	4.1		III	Category A	
2002	CELLULOID, SCRAP	4.2		III	Category D	
2004	MAGNESIUM DIAMIDE	4.2		II	Category C	
2006	PLASTICS, NITROCELLULOSE-BASED, SELF-HEATING, N.O.S.	4.2		III	Category C	
2008	ZIRCONIUM POWDER, DRY	4.2		I	Category D	
2008	ZIRCONIUM POWDER, DRY	4.2		II	Category D	
2008	ZIRCONIUM POWDER, DRY	4.2		III	Category D	
2009	ZIRCONIUM, DRY finished sheets, strip or coiled wire	4.2		III	Category D	
2010	MAGNESIUM HYDRIDE	4.3		I	Category E	SG35
2011	MAGNESIUM PHOSPHIDE	4.3	6.1	I	Category E SW2 SW5	SG35
2012	POTASSIUM PHOSPHIDE	4.3	6.1	I	Category E SW2 SW5	SG35
2013	STRONTIUM PHOSPHIDE	4.3	6.1	I	Category E SW2 SW5	SG35
2014	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydroge	5.1	8	II	Category D SW1	SG16 SG59 SG72
2015	HYDROGEN PEROXIDE, STABILIZED or HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED with mo	5.1	8	I	Category D SW1	SG16 SG59
2016	AMMUNITION, TOXIC, NON-EXPLOSIVE without burster or expelling charge, non-fuzed	6.1		II	Category E SW2 H1	
2017	AMMUNITION, TEAR-PRODUCING, NON-EXPLOSIVE without burster or expelling charge, non-fuzed	6.1		II	Category E SW2 H1	
2018	CHLOROANILINES, SOLID	6.1		II	Category A	
2019	CHLOROANILINES, LIQUID	6.1		II	Category A	SG35
2020	CHLOROPHENOLS, SOLID	6.1		III	Category A	
2021	CHLOROPHENOLS, LIQUID	6.1		III	Category A	
2022	CRESYLIC ACID	6.1	8	II	Category B	

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2023	EPICHLOROHYDRIN	6.1	3P	II	Category A SW2	
2024	MERCURY COMPOUND, LIQUID, N.O.S.	6.1	P	I	Category B SW2	
2024	MERCURY COMPOUND, LIQUID, N.O.S.	6.1	P	II	Category B SW2	
2024	MERCURY COMPOUND, LIQUID, N.O.S.	6.1	P	III	Category B SW2	
2025	MERCURY COMPOUND, SOLID, N.O.S.	6.1	P	I	Category A	
2025	MERCURY COMPOUND, SOLID, N.O.S.	6.1	P	II	Category A	
2025	MERCURY COMPOUND, SOLID, N.O.S.	6.1	P	III	Category A	
2026	PHENYLMERCURIC COMPOUND, N.O.S.	6.1	P	I	Category A	
2026	PHENYLMERCURIC COMPOUND, N.O.S.	6.1	P	II	Category A	
2026	PHENYLMERCURIC COMPOUND, N.O.S.	6.1	P	III	Category A	
2027	SODIUM ARSENITE, SOLID	6.1		II	Category A	
2028	BOMBS, SMOKE, NON-EXPLOSIVE with corrosive liquid, without initiating device	8		II	Category E SW2	
2029	HYDRAZINE, ANHYDROUS	8	3/6.1	I	Category D SW2	SG5 SG8 SG35
2030	HYDRAZINE, AQUEOUS SOLUTION with more than 37% hydrazine, by mass	8	6.1	I	Category D SW2	SG35
2030	HYDRAZINE, AQUEOUS SOLUTION with more than 37% hydrazine, by mass	8	6.1	II	Category D SW2	SG35
2030	HYDRAZINE, AQUEOUS SOLUTION with more than 37% hydrazine, by mass	8	6.1	III	Category D SW2	SG35
2031	NITRIC ACID other than red fuming, with more than 70% nitric acid	8	5.1	I	Category D	SG6 SG16 SG17 SG19
2031	NITRIC ACID other than red fuming, with at least 65% but not more than 70% nitric acid	8	5.1	II	Category D	SG6 SG16 SG17 SG19
2031	NITRIC ACID other than red fuming, with less than 65% nitric acid	8		II	Category D	
2032	NITRIC ACID, RED FUMING	8	5.1/6.1	I	Category D SW2	SG6 SG16 SG17 SG19
2033	POTASSIUM MONOXIDE	8		II	Category A	SG22 SG35
2034	HYDROGEN AND METHANE MIXTURE, COMPRESSED	2.1			Category E SW2	SG46
2035	1,1,1-TRIFLUOROETHANE (REFRIGERANT GAS R 143a)	2.1			Category B SW2	
2036	XENON	2.2			Category A	
2037	RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) without a release device, non refill	2			Category B SW2	
2038	DINITROTOLUENES, LIQUID	6.1		II	Category A	
2044	2,2-DIMETHYLPROPANE	2.1			Category E SW2	
2045	ISOBUTYL ALDEHYDE (ISOBUTYRALDEHYDE)	3		II	Category E SW2	

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2046	CYMENES	3	P	III	Category A	
2047	DICHLOROPROPENES	3		II	Category B	
2047	DICHLOROPROPENES	3		III	Category A	
2048	DICYCLOPENTADIENE	3		III	Category A	
2049	DIETHYLBENZENES	3		III	Category A	
2050	DIISOBUTYLENES, ISOMERIC COMPOUNDS	3		II	Category B	
2051	2-DIMETHYLAMINOETHANOL	8	3	II	Category A	
2052	DIPENTENE	3	P	III	Category A	
2053	METHYL ISOBUTYL CARBINOL	3		III	Category A	
2054	MORPHOLINE	8	3	I	Category A	
2055	STYRENE MONOMER, STABILIZED	3		III	Category A	
2056	TETRAHYDROFURAN	3		II	Category B	
2057	TRIPROPYLENE	3		II	Category B	
2057	TRIPROPYLENE	3		III	Category A	
2058	VALERALDEHYDE	3		II	Category B	
2059	NITROCELLULOSE SOLUTION, FLAMMABLE with not more than 12.6% nitrogen, by dry mass, and n	3		I	Category E	
2059	NITROCELLULOSE SOLUTION, FLAMMABLE with not more than 12.6% nitrogen, by dry mass, and n	3		II	Category B	
2059	NITROCELLULOSE SOLUTION, FLAMMABLE with not more than 12.6% nitrogen, by dry mass, and n	3		III	Category A	
2067	AMMONIUM NITRATE BASED FERTILIZER	5.1		III	Category C SW1 SW14 SW23	SG16 SG42 SG45 SG47 SG48 SG51 SG56 SG58 SG59 SG61
2071	AMMONIUM NITRATE BASED FERTILIZER	9		III	Category A SW26	
2073	AMMONIA SOLUTION relative density less than 0.880 at 15°C in water, with more than 35% b	2.2			Category E SW2	SG35 SG46
2074	ACRYLAMIDE, SOLID	6.1		III	Category A SW1 H2	
2075	CHLORAL, ANHYDROUS, STABILIZED	6.1		II	Category D SW2	
2076	CRESOLS, LIQUID	6.1	8	II	Category B	
2077	alpha-NAPHTHYLAMINE	6.1		III	Category A	
2078	TOLUENE DIISOCYANATE	6.1		II	Category C SW1 SW2	
2079	DIETHYLENETRIAMINE	8		II	Category A SW2	SG35
2186	HYDROGEN CHLORIDE, REFRIGERATED LIQUID	2.3	8		-	
2187	CARBON DIOXIDE, REFRIGERATED LIQUID	2.2			Category D	
2188	ARSINE	2.3	2.1		Category D SW2	

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2189	DICHLOROSILANE	2.3	2.1/8		Category D SW2	SG4 SG9 SG72
2190	OXYGEN DIFLUORIDE, COMPRESSED	2.3	5.1/8		Category D SW2 H1	SG6 SG19
2191	SULPHURYL FLUORIDE	2.3			Category D SW2	
2192	GERMANE	2.3	2.1		Category D SW2	
2193	HEXAFLUOROETHANE (REFRIGERANT GAS R 116)	2.2			Category A	
2194	SELENIUM HEXAFLUORIDE	2.3	8		Category D SW2	
2195	TELLURIUM HEXAFLUORIDE	2.3	8		Category D SW2	
2196	TUNGSTEN HEXAFLUORIDE	2.3	8		Category D SW2	
2197	HYDROGEN IODIDE, ANHYDROUS	2.3	8		Category D SW2	
2198	PHOSPHORUS PENTAFLUORIDE	2.3	8		Category D SW2	
2199	PHOSPHINE	2.3	2.1		Category D SW2	
2200	PROPADIENE, STABILIZED	2.1			Category B SW2	
2201	NITROUS OXIDE, REFRIGERATED LIQUID	2.2			Category D SW2	
2202	HYDROGEN SELENIDE, ANHYDROUS	2.3	2.1		Category D SW2	
2203	SILANE	2.1			Category E SW2	SG43 SG46
2204	CARBONYL SULPHIDE	2.3			Category D SW2	
2205	ADIPONITRILE	6.1		III	Category A	
2206	ISOCYANATES, TOXIC, N.O.S. or ISOCYANATE SOLUTION, TOXIC, N.O.S.	6.1		II	Category E SW1 SW2	
2206	ISOCYANATES, TOXIC, N.O.S. or ISOCYANATE SOLUTION, TOXIC, N.O.S.	6.1		III	Category E SW1 SW2	
2208	CALCIUM HYPOCHLORITE MIXTURE, DRY with more than 10% but not more than 39% available chlorine	5.1		III	Category D SW1 SW11	SG35 SG38 SG49 SG53 SG60
2209	FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	8		III	Category A	
2210	MANEB or MANEB PREPARATION with not less than 60% maneb	4.2	4.3 P	III	Category A	SG29
2211	POLYMERIC BEADS, EXPANDABLE evolving flammable vapour	9		III	Category E SW1 SW6	SG5 SG14
2212	BLUE ASBESTOS (crocidolite) or BROWN ASBESTOS (amosite, mysorite)	9		II	Category A SW2	SG29
2213	PARAFORMALDEHYDE	4.1		III	Category A SW23	
2214	PHTHALIC ANHYDRIDE with more than 0.05% of maleic anhydride	8		III	Category A	

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2215	MALEIC ANHYDRIDE	8		III	Category A	SG50 SG57
2215	MALEIC ANHYDRIDE, MOLTEN	8		III	Category A	SG50 SG57
2216	FISHMEAL (FISHSCRAP), STABILIZED Anti-oxidant treated. Moisture content greater than 5% but not exceeding 12%, by mass. Fat content not more than 15%	9		III	Category B SW24	SG18 SG65
2217	SEED CAKE with not more than 1.5% oil and not more than 11% moisture	4.2		III	Category A SW1 SW4 H1	
2218	ACRYLIC ACID, STABILIZED	8	3	II	Category C SW1 SW2	
2219	ALLYL GLYCIDYL ETHER	3		III	Category A	
2222	ANISOLE	3		III	Category A	
2224	BENZONITRILE	6.1		II	Category A SW2	SG35
2225	BENZENESULPHONYL CHLORIDE	8		III	Category A SW2	
2226	BENZOTRICHLORIDE	8		II	Category A SW2	
2227	n-BUTYL METHACRYLATE, STABILIZED	3		III	Category A	
2232	2-CHLOROETHANAL	6.1		I	Category D SW2	
2233	CHLOROANISIDINES	6.1		III	Category A	
2234	CHLOROBENZOTRIFLUORIDES	3		III	Category A SW2	
2235	CHLOROBENZYL CHLORIDES, LIQUID	6.1	P	III	Category A	
2236	3-CHLORO-4-METHYLPHENYLISOCYANATE, LIQUID	6.1		II	Category B SW2	
2237	CHLORONITROANILINES	6.1	P	III	Category A	
2238	CHLOROTOLUENES	3		III	Category A	
2239	CHLOROTOLUIDINES, SOLID	6.1		III	Category A	
2240	CHROMOSULPHURIC ACID	8		I	Category B SW2	SG6 SG16 SG17 SG19
2241	CYCLOHEPTANE	3		II	Category B SW2	
2242	CYCLOHEPTENE	3		II	Category B	
2243	CYCLOHEXYL ACETATE	3		III	Category A	
2244	CYCLOPENTANOL	3		III	Category A	
2245	CYCLOPENTANONE	3		III	Category A	
2246	CYCLOPENTENE	3		II	Category E	
2247	n-DECANE	3		III	Category A	
2248	DI-n-BUTYLAMINE	8	3	II	Category A	
2249	DICHLORODIMETHYL ETHER, SYMMETRICAL	6.1	3	I	Category D SW2	
2250	DICHLOROPHENYL ISOCYANATES	6.1		II	Category B SW1 SW2	

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2251	BICYCLO[2.2.1]HEPTA-2,5-DIENE, STABILIZED (2,5-NORBORNADIENE, STABILIZED)	3		II	Category D	
2252	1,2-DIMETHOXYETHANE	3		II	Category B	
2253	N,N-DIMETHYLANILINE	6.1		II	Category A	
2254	MATCHES, FUSEE	4.1		III	Category A	
2256	CYCLOHEXENE	3		II	Category E	
2257	POTASSIUM	4.3		I	Category D	SG35
2258	1,2-PROPYLENEDIAMINE	8	3	II	Category A SW2	
2259	TRIETHYLENETETRAMINE	8		II	Category B SW2	SG35
2260	TRIPROPYLAMINE	3	8	III	Category A SW2	
2261	XYLENOLS, SOLID	6.1		II	Category A	
2262	DIMETHYLCARBAMOYL CHLORIDE	8		II	Category A SW2	
2263	DIMETHYLCYCLOHEXANES	3		II	Category B	
2264	N,N-DIMETHYLCYCLOHEXYLAMINE	8	3	II	Category A SW2	
2265	N,N-DIMETHYLFORMAMIDE	3		III	Category A	
2266	N,N-DIMETHYL PROPYLAMINE	3	8	II	Category B SW2	
2267	DIMETHYL THIOPHOSPHORYL CHLORIDE	6.1	8	II	Category B SW1	
2269	3,3'-IMINODIPROPYLAMINE	8		III	Category A	
2270	ETHYLAMINE, AQUEOUS SOLUTION with not less than 50% but not more than 70% ethylamine	3	8	II	Category B SW2	SG35
2271	ETHYL AMYL KETONES	3		III	Category A	
2272	N-ETHYLANILINE	6.1		III	Category A	SG17 SG35
2273	2-ETHYLANILINE	6.1		III	Category A	SG17 SG35
2274	N-ETHYL-N-BENZYLANILINE	6.1		III	Category A	
2275	2-ETHYLBUTANOL	3		III	Category A	
2276	2-ETHYLHEXYLAMINE	3	8	III	Category A SW2	
2277	ETHYL METHACRYLATE, STABILIZED	3		II	Category B	
2278	n-HEPTENE	3		II	Category B	
2279	HEXACHLOROBUTADIENE	6.1	P	III	Category A	
2280	HEXAMETHYLENEDIAMINE, SOLID	8		III	Category A SW1 H2	
2280	HEXAMETHYLENEDIAMINE, MOLTEN	8		III	Category A SW1 H2	
2281	HEXAMETHYLENE DIISOCYANATE	6.1		II	Category C SW2 H1	
2282	HEXANOLS	3		III	Category A	
2283	ISOBUTYL METHACRYLATE, STABILIZED	3		III	Category A	
2284	ISOBUTYRONITRILE	3	6.1	II	Category E SW2	

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2285	ISOCYANATOBENZOTRIFLUORIDES	6.1	3	II	Category D SW1 SW2	
2286	PENTAMETHYLHEPTANE	3		III	Category A	
2287	ISOHEPTENES	3		II	Category B	
2288	ISOHEXENES	3		II	Category E	
2289	ISOPHORONEDIAMINE	8		III	Category A	
2290	ISOPHORONE DIISOCYANATE	6.1		III	Category B SW2	
2291	LEAD COMPOUND, SOLUBLE, N.O.S.	6.1	P	III	Category A	
2293	4-METHOXY-4-METHYLPENTAN-2-ONE	3		III	Category A	
2294	N-METHYLANILINE	6.1		III	Category A	
2295	METHYL CHLOROACETATE	6.1	3	I	Category D	
2296	METHYLCYCLOHEXANE	3		II	Category B	
2297	METHYLCYCLOHEXANONES	3		III	Category A	
2298	METHYLCYCLOPENTANE	3		II	Category B	
2299	METHYL DICHLOROACETATE	6.1		III	Category A	
2300	2-METHYL-5-ETHYLPYRIDINE	6.1		III	Category A	
2301	2-METHYLFURAN	3		II	Category E	
2302	5-METHYLHEXAN-2-ONE	3		III	Category A	
2303	ISOPROPENYLBENZENE	3		III	Category A	
2304	NAPHTHALENE, MOLTEN	4.1		III	Category C	
2305	NITROBENZENESULPHONIC ACID	8		II	Category A	
2306	NITROBENZOTRIFLUORIDES, LIQUID	6.1	P	II	Category A SW2	
2307	3-NITRO-4-CHLOROBENZOTRIFLUORIDE	6.1	P	II	Category A SW2	
2308	NITROSYLSULPHURIC ACID, LIQUID	8		II	Category D SW2	SG6 SG16 SG17 SG19
2309	OCTADIENE	3		II	Category B	
2310	PENTANE-2,4-DIONE	3	6.1	III	Category A	
2311	PHENETIDINES	6.1		III	Category A	
2312	PHENOL, MOLTEN	6.1		II	Category B SW2	
2313	PICOLINES	3		III	Category A SW2	
2315	POLYCHLORINATED BIPHENYLS, LIQUID	9	P	II	Category A	SG50
2316	SODIUM CUPROCYANIDE, SOLID	6.1	P	I	Category A	SG35
2317	SODIUM CUPROCYANIDE SOLUTION	6.1	P	I	Category B SW2	SG35
2318	SODIUM HYDROSULPHIDE with less than 25% water of crystallization	4.2		II	Category A	SG35
2319	TERPENE HYDROCARBONS, N.O.S.	3		III	Category A	
2320	TETRAETHYLENEPENTAMINE	8		III	Category A	SG35
2321	TRICHLOROBENZENES, LIQUID	6.1	P	III	Category A	

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2322	TRICHLOROBUTENE	6.1	P	II	Category A SW1 SW2	
2323	TRIETHYL PHOSPHITE	3		III	Category A	
2324	TRIISOBUTYLENE	3		III	Category A	
2325	1,3,5-TRIMETHYLBENZENE	3		III	Category A	
2326	TRIMETHYLCYCLOHEXYLAMINE	8		III	Category A	
2327	TRIMETHYLHEXAMETHYLENEDIAMINES	8		III	Category A	
2328	TRIMETHYLHEXAMETHYLENE DIISOCYANATE	6.1		III	Category B	
2329	TRIMETHYL PHOSPHITE	3		III	Category A	
2330	UNDECANE	3		III	Category A	
2331	ZINC CHLORIDE, ANHYDROUS	8		III	Category A	
2332	ACETALDEHYDE OXIME	3		III	Category A	
2333	ALLYL ACETATE	3	6.1	II	Category E SW2	
2334	ALLYLAMINE	6.1	3	I	Category D SW2	
2335	ALLYL ETHYL ETHER	3	6.1	II	Category E SW2	
2336	ALLYL FORMATE	3	6.1	I	Category E SW2	
2337	PHENYL MERCAPTAN	6.1	3	I	Category D SW2	SG35
2338	BENZOTRIFLUORIDE	3		II	Category B SW2	
2339	2-BROMOBUTANE	3		II	Category B SW2	
2340	2-BROMOETHYL ETHYL ETHER	3		II	Category B SW2	
2341	1-BROMO-3-METHYLBUTANE	3		III	Category A	
2342	BROMOMETHYLPROPANES	3		II	Category B	
2343	2-BROMOPENTANE	3		II	Category B	
2344	BROMOPROPANES	3		II	Category B SW2	
2344	BROMOPROPANES	3		III	Category A	
2345	3-BROMOPROPYNE	3		II	Category D SW2	
2346	BUTANEDIONE	3		II	Category B	
2347	BUTYL MERCAPTANS	3		II	Category B	SG35 SG50 SG57
2348	BUTYL ACRYLATES, STABILIZED	3		III	Category A	
2350	BUTYL METHYL ETHER	3		II	Category B	
2351	BUTYL NITRITES	3		II	Category B SW2	
2351	BUTYL NITRITES	3		III	Category A SW2	
2352	BUTYL VINYL ETHER, STABILIZED	3		II	Category B SW2	
2353	BUTYRYL CHLORIDE	3	8	II	Category C SW2	

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2354	CHLOROMETHYL ETHYL ETHER	3	6.1	II	Category E SW2	
2356	2-CHLOROPROPANE	3		I	Category E	
2357	CYCLOHEXYLAMINE	8	3	II	Category A SW2	
2358	CYCLOOCTATETRAENE	3		II	Category B	
2359	DIALLYLAMINE	3	6.1/8	II	Category B SW2	SG5 SG8
2360	DIALLYL ETHER	3	6.1	II	Category E	
2361	DIISOBUTYLAMINE	3	8	III	Category A	
2362	1,1-DICHLOROETHANE	3		II	Category B SW2	
2363	ETHYL MERCAPTAN	3	P	I	Category E	SG50 SG57
2364	n-PROPYLBENZENE	3		III	Category A	
2366	DIETHYL CARBONATE	3		III	Category A	
2367	alpha-METHYLVALERALDEHYDE	3		II	Category B	
2368	alpha-PINENE	3		III	Category A	
2370	1-HEXENE	3		II	Category E	
2371	ISOPENTENES	3		I	Category E	
2372	1,2-DI(DIMETHYLAMINO)ETHANE	3		II	Category B	
2373	DIETHOXYMETHANE	3		II	Category B	
2374	3,3-DIETHOXYPROPENE	3		II	Category B	
2375	DIETHYL SULPHIDE	3		II	Category E	
2376	2,3-DIHYDROPYRAN	3		II	Category B	
2377	1,1-DIMETHOXYETHANE	3		II	Category B	
2378	2-DIMETHYLAMINOACETONITRILE	3	6.1	II	Category A SW2	SG35
2379	1,3-DIMETHYLBUTYLAMINE	3		II	Category B	SG35
2380	DIMETHYLDIETHOXYSILANE	3		II	Category B	
2381	DIMETHYL DISULPHIDE	3	6.1	II	Category B SW2	
2382	DIMETHYLHYDRAZINE, SYMMETRICAL	6.1	3P	I	Category D SW2	SG17 SG35
2383	DIPROPYLAMINE	3	8	II	Category B	
2384	DI-n-PROPYL ETHER	3		II	Category B	
2385	ETHYL ISOBUTYRATE	3		II	Category B	
2386	1-ETHYLPIPERIDINE	3	8	II	Category B	SG35
2387	FLUOROBENZENE	3		II	Category B	
2388	FLUOROTOLUENES	3		II	Category B	
2389	FURAN	3		I	Category E SW2	
2390	2-IODOBUTANE	3		II	Category B	
2391	IODOMETHYLPROPANES	3		II	Category B	
2392	IODOPROPANES	3		III	Category A	
2393	ISOBUTYL FORMATE	3		II	Category B	
2394	ISOBUTYL PROPIONATE	3		III	Category B	

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2395	ISOBUTYRYL CHLORIDE	3	8	II	Category C SW2	
2396	METHACRYLALDEHYDE, STABILIZED	3	6.1	II	Category E SW2	
2397	3-METHYLBUTAN-2-ONE	3		II	Category B	
2398	METHYL tert-BUTYL ETHER	3		II	Category E	
2399	1-METHYLPIPERIDINE	3	8	II	Category B	SG35
2400	METHYL ISOVALERATE	3		II	Category B	
2401	PIPERIDINE	8	3	I	Category D	SG35
2402	PROPANETHIOLS	3		II	Category E	SG50 SG57
2403	ISOPROPENYL ACETATE	3		II	Category B	
2404	PROPIONITRILE	3	6.1	II	Category E SW2	
2405	ISOPROPYL BUTYRATE	3		III	Category A	
2406	ISOPROPYL ISOBUTYRATE	3		II	Category B	
2407	ISOPROPYL CHLOROFORMATE	6.1	"3/8	I	Category D SW2	SG5 SG8
2409	ISOPROPYL PROPIONATE	3		II	Category B	
2410	1,2,3,6-TETRAHYDROPYRIDINE	3		II	Category B	
2411	BUTYRONITRILE	3	6.1	II	Category E SW2	
2412	TETRAHYDROTHIOPHENE	3		II	Category B	
2413	TETRAPROPYL ORTHOTITANATE	3		III	Category A	
2414	THIOPHENE	3		II	Category B SW2	
2416	TRIMETHYL BORATE	3		II	Category B	
2417	CARBONYL FLUORIDE	2.3			Category D SW2	
2418	SULPHUR TETRAFLUORIDE	2.3	8		Category D SW2	SG35
2419	BROMOTRIFLUOROETHYLENE	2.1			Category B SW2	
2420	HEXAFLUOROACETONE	2.3	8		Category D SW2	
2421	NITROGEN TRIOXIDE	2.3	"5.1/8		Category D SW2	SG6 SG19
2422	OCTAFLUOROBUT-2-ENE (REFRIGERANT GAS R 1318)	2.2			Category A	
2424	OCTAFLUOROPROPANE (REFRIGERANT GAS R 218)	2.2			Category A	
2426	AMMONIUM NITRATE, LIQUID (hot concentrated solution)	5.1			Category D	SG42 SG45 SG47 SG48 SG51 SG56 SG58 SG59 SG61
2427	POTASSIUM CHLORATE, AQUEOUS SOLUTION	5.1		II	Category B	SG38 SG49 SG62
2427	POTASSIUM CHLORATE, AQUEOUS SOLUTION	5.1		III	Category B	SG38 SG49 SG62

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2428	SODIUM CHLORATE, AQUEOUS SOLUTION	5.1		II	Category B	SG38 SG49 SG62
2428	SODIUM CHLORATE, AQUEOUS SOLUTION	5.1		III	Category B	SG38 SG49 SG62
2429	CALCIUM CHLORATE, AQUEOUS SOLUTION	5.1		II	Category B	SG38 SG49 SG62
2429	CALCIUM CHLORATE, AQUEOUS SOLUTION	5.1		III	Category B	SG38 SG49 SG62
2430	ALKYLPHENOLS, SOLID, N.O.S. (including C2-C12 homologues)	8		I	Category B	
2430	ALKYLPHENOLS, SOLID, N.O.S. (including C2-C12 homologues)	8		II	Category B	
2430	ALKYLPHENOLS, SOLID, N.O.S. (including C2-C12 homologues)	8		III	Category A	
2431	ortho-ANISIDINE	6.1		III	Category A	
2432	N,N-DIETHYLANILINE	6.1		III	Category A	
2433	CHLORONITROTOLUENES, LIQUID	6.1	P	III	Category A	SG6 SG8 SG10 SG12
2434	DIBENZYLDICHLOROSILANE	8		II	Category C SW2	
2435	ETHYLPHENYLDICHLOROSILANE	8		II	Category C	
2436	THIOACETIC ACID	3		II	Category B	
2437	METHYLPHENYLDICHLOROSILANE	8		II	Category C SW2	
2438	TRIMETHYLACETYL CHLORIDE	6.1	"3/8	I	Category D SW1 SW2	SG5 SG8
2439	SODIUM HYDROGENDIFLUORIDE	8		II	Category A SW1 SW2 H2	SG35
2440	STANNIC CHLORIDE PENTAHYDRATE	8		III	Category A	
2441	TITANIUM TRICHLORIDE, PYROPHORIC or TITANIUM TRICHLORIDE MIXTURE, PYROPHORIC	4.2	8	I	Category D SW2	
2442	TRICHLOROACETYL CHLORIDE	8		II	Category D SW2	
2443	VANADIUM OXYTRICHLORIDE	8		II	Category C SW2	
2444	VANADIUM TETRACHLORIDE	8		I	Category C SW2	
2446	NITROCRESOLS, SOLID	6.1		III	Category A	
2447	PHOSPHORUS, WHITE, MOLTEN	4.2	6.1P	I	Category D	
2448	SULPHUR, MOLTEN	4.1		III	Category C	SG17
2451	NITROGEN TRIFLUORIDE	2.2	5.1		Category D SW2	
2452	ETHYLACETYLENE, STABILIZED	2.1			Category B SW2	
2453	ETHYL FLUORIDE (REFRIGERANT GAS R 161)	2.1			Category E SW2	

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2454	METHYL FLUORIDE (REFRIGERANT GAS R 41)	2.1			Category E SW2	
2455	METHYL NITRITE	2.2			-	
2456	2-CHLOROPROPENE	3		I	Category E	
2457	2,3-DIMETHYLBUTANE	3		II	Category E	
2458	HEXADIENES	3		II	Category B	
2459	2-METHYL-1-BUTENE	3		I	Category E	
2460	2-METHYL-2-BUTENE	3		II	Category E	
2461	METHYLPENTADIENES	3		II	Category E	
2463	ALUMINIUM HYDRIDE	4.3		I	Category E	
2464	BERYLLIUM NITRATE	5.1	6.1	II	Category A	
2465	DICHLOROISOCYANURIC ACID, DRY or DICHLOROISOCYANURIC ACID, SALTS	5.1		II	Category A H1	
2466	POTASSIUM SUPEROXIDE	5.1		I	Category E H1	SG16 SG35 SG59
2468	TRICHLOROISOCYANURIC ACID, DRY	5.1		II	Category A H1	
2469	ZINC BROMATE	5.1		III	Category A	SG38 SG49
2470	PHENYLACETONITRILE, LIQUID	6.1		III	Category A	SG35
2471	OSMIUM TETROXIDE	6.1		I	Category B SW2	
2473	SODIUM ARSANILATE	6.1		III	Category A	
2474	THIOPHOSGENE	6.1		I	Category D SW2	SG35
2475	VANADIUM TRICHLORIDE	8		III	Category A SW2	
2477	METHYL ISOTHIOCYANATE	6.1	3	I	Category D SW2	
2478	ISOCYANATES, FLAMMABLE, TOXIC, N.O.S. or ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S.	3	6.1	II	Category D SW2	
2478	ISOCYANATES, FLAMMABLE, TOXIC, N.O.S. or ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S.	3	6.1	III	Category A	
2480	METHYL ISOCYANATE	6.1	3	I	Category D SW2	SG35
2481	ETHYL ISOCYANATE	6.1	3	I	Category D SW2	SG35
2482	n-PROPYL ISOCYANATE	6.1	3	I	Category D SW2	
2483	ISOPROPYL ISOCYANATE	6.1	3	I	Category D SW2	
2484	tert-BUTYL ISOCYANATE	6.1	3	I	Category D SW2	
2485	n-BUTYL ISOCYANATE	6.1	3	I	Category D SW2	
2486	ISOBUTYL ISOCYANATE	6.1	3	I	Category D SW2	
2487	PHENYL ISOCYANATE	6.1	3	I	Category D SW2	
2488	CYCLOHEXYL ISOCYANATE	6.1	3	I	Category D SW2	

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2490	DICHLOROISOPROPYL ETHER	6.1		II	Category B	
2491	ETHANOLAMINE or ETHANOLAMINE SOLUTION	8		III	Category A	SG35
2493	HEXAMETHYLENEIMINE	3	8	II	Category B SW2	
2495	IODINE PENTAFLUORIDE	5.1	"6.1/8	I	Category D SW1 SW2	SG6 SG16 SG19 SG35
2496	PROPIONIC ANHYDRIDE	8		III	Category A	
2498	1,2,3,6-TETRAHYDROBENZALDEHYDE	3		III	Category A	
2501	TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE SOLUTION	6.1		II	Category A	
2501	TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE SOLUTION	6.1		III	Category A	
2502	VALERYL CHLORIDE	8	3	II	Category C SW2	
2503	ZIRCONIUM TETRACHLORIDE	8		III	Category A	
2504	TETRABROMOETHANE	6.1	P	III	Category A	
2505	AMMONIUM FLUORIDE	6.1		III	Category A	SG35
2506	AMMONIUM HYDROGEN SULPHATE	8		II	Category A SW2	
2507	CHLOROPLATINIC ACID, SOLID	8		III	Category A	
2508	MOLYBDENUM PENTACHLORIDE	8		III	Category C SW2	
2509	POTASSIUM HYDROGEN SULPHATE	8		II	Category A	
2511	2-CHLOROPROPIONIC ACID	8		III	Category A	
2512	AMINOPHENOLS (o-, m-, p-)	6.1		III	Category A	
2513	BROMOACETYL BROMIDE	8		II	Category C SW2	SG36
2514	BROMOBENZENE	3		III	Category A	
2515	BROMOFORM	6.1	P	III	Category A SW1 SW2 H2	
2516	CARBON TETRABROMIDE	6.1	P	III	Category A SW1	
2517	1-CHLORO-1,1-DIFLUOROETHANE (REFRIGERANT GAS R 142b)	2.1			Category B SW2	
2518	1,5,9-CYCLODODECATRIENE	6.1		III	Category A SW2	
2520	CYCLOOCTADIENES	3		III	Category A	
2521	DIKETENE, STABILIZED	6.1	3	I	Category D SW2	SG20 SG21
2522	2-DIMETHYLAMINOETHYL METHACRYLATE	6.1		II	Category D SW2	
2524	ETHYL ORTHOFORMATE	3		III	Category A	
2525	ETHYL OXALATE	6.1		III	Category A	
2526	FURFURYLAMINE	3	8	III	Category A SW2	
2527	ISOBUTYL ACRYLATE, STABILIZED	3		III	Category A	
2528	ISOBUTYL ISOBUTYRATE	3		III	Category A	
2529	ISOBUTYRIC ACID	3	8	III	Category A	

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2531	METHACRYLIC ACID, STABILIZED	8		II	Category C SW2	
2533	METHYL TRICHLOROACETATE	6.1		III	Category A	
2534	METHYLCHLOROSILANE	2.3	2.1/8		Category D SW2	SG4 SG9
2535	4-METHYLMORPHOLINE (N-METHYLMORPHOLINE)	3	8	II	Category B SW2	
2536	METHYLTETRAHYDROFURAN	3		II	Category B	
2538	NITRONAPHTHALENE	4.1		III	Category A	
2541	TERPINOLENE	3		III	Category A	
2542	TRIBUTYLAMINE	6.1		II	Category A	
2545	HAFNIUM POWDER, DRY	4.2		I	Category D	
2545	HAFNIUM POWDER, DRY	4.2		II	Category D	
2545	HAFNIUM POWDER, DRY	4.2		III	Category D	
2546	TITANIUM POWDER, DRY	4.2		I	Category D	
2546	TITANIUM POWDER, DRY	4.2		II	Category D	
2546	TITANIUM POWDER, DRY	4.2		III	Category D	
2547	SODIUM SUPEROXIDE	5.1		I	Category E H1	SG16 SG35 SG59
2548	CHLORINE PENTAFLUORIDE	2.3	5.1/8		Category D SW2	SG6 SG19
2552	HEXAFLUOROACETONE HYDRATE, LIQUID	6.1		II	Category B SW2	
2554	METHYLALLYL CHLORIDE	3		II	Category E	
2555	NITROCELLULOSE WITH WATER (not less than 25% water, by mass)	4.1		II	Category E	SG7 SG30
2556	NITROCELLULOSE WITH ALCOHOL (not less than 25% alcohol, by mass, and not more than 12.6%	4.1		II	Category D	SG7 SG30
2557	NITROCELLULOSE with not more than 12.6% nitrogen, by dry mass, MIXTURE WITH or WITHOUT PLASTICIZER, WITH or WITHOUT PIGMENT	4.1		II	Category D	SG7 SG30
2558	EPIBROMOHYDRIN	6.1	3P	I	Category D SW2	
2560	2-METHYLPENTAN-2-OL	3		III	Category A	
2561	3-METHYL-1-BUTENE	3		I	Category E	
2564	TRICHLOROACETIC ACID SOLUTION	8		II	Category B	
2564	TRICHLOROACETIC ACID SOLUTION	8		III	Category B	
2565	DICYCLOHEXYLAMINE	8		III	Category A	
2567	SODIUM PENTACHLOROPHENATE	6.1	P	II	Category A	
2570	CADMIUM COMPOUND	6.1		I	Category A	
2570	CADMIUM COMPOUND	6.1		II	Category A	
2570	CADMIUM COMPOUND	6.1		III	Category A	
2571	ALKYLSULPHURIC ACIDS	8		II	Category C SW15	
2572	PHENYLHYDRAZINE	6.1		II	Category A SW2	
2573	THALLIUM CHLORATE	5.1	6.1P	II	Category A	SG38 SG49

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2574	TRICRESYL PHOSPHATE with more than 3% ortho-isomer	6.1	P	II	Category A	
2576	PHOSPHORUS OXYBROMIDE, MOLTEN	8		II	Category C SW2	
2577	PHENYLACETYL CHLORIDE	8		II	Category C SW2	
2578	PHOSPHORUS TRIOXIDE	8		III	Category A SW1 H2	
2579	PIPERAZINE	8		III	Category A SW1 H2	SG35
2580	ALUMINIUM BROMIDE SOLUTION	8		III	Category A	
2581	ALUMINIUM CHLORIDE SOLUTION	8		III	Category A	
2582	FERRIC CHLORIDE SOLUTION	8		III	Category A	
2583	ALKYLSULPHONIC ACIDS, SOLID or ARYLSULPHONIC ACIDS, SOLID with more than 5% free sulphur	8		II	Category A	
2584	ALKYLSULPHONIC ACIDS, LIQUID or ARYLSULPHONIC ACIDS, LIQUID with more than 5% free sulph	8		II	Category B	
2585	ALKYLSULPHONIC ACIDS, SOLID or ARYLSULPHONIC ACIDS, SOLID with not more than 5% free sul	8		III	Category A	
2586	ALKYLSULPHONIC ACIDS, LIQUID or ARYLSULPHONIC ACIDS, LIQUID with not more than 5% free s	8		III	Category B	
2587	BENZOQUINONE	6.1		II	Category A	
2588	PESTICIDE, SOLID, TOXIC, N.O.S.	6.1		I	Category A SW2	
2588	PESTICIDE, SOLID, TOXIC, N.O.S.	6.1		II	Category A SW2	
2588	PESTICIDE, SOLID, TOXIC, N.O.S.	6.1		III	Category A SW2	
2589	VINYL CHLOROACETATE	6.1	3	II	Category A	
2590	WHITE ASBESTOS (chrysotile, actinolite, anthophyllite, tremolite)	9		III	Category A SW2	SG29
2591	XENON, REFRIGERATED LIQUID	2.2			Category D	
2599	CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE with approximately 60% ch	2.2			Category A	
2601	CYCLOBUTANE	2.1			Category B SW2	
2602	DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE with approximately 74% dic	2.2			Category A	
2603	CYCLOHEPTATRIENE	3	6.1	II	Category E SW2	
2604	BORON TRIFLUORIDE DIETHYL ETHERATE	8	3	I	Category D SW2	
2605	METHOXYMETHYL ISOCYANATE	6.1	3	I	Category D SW2	
2606	METHYL ORTHOSILICATE	6.1	3	I	Category D SW2	
2607	ACROLEIN DIMER, STABILIZED	3		III	Category A SW2	
2608	NITROPROPANES	3		III	Category A	
2609	TRIALLYL BORATE	6.1		III	Category A H1	

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2610	TRIALLYLAMINE	3	8	III	Category A SW2	
2611	PROPYLENE CHLOROHYDRIN	6.1	3	II	Category A SW1 SW2 H2	
2612	METHYL PROPYL ETHER	3		II	Category E SW2	
2614	METHALLYL ALCOHOL	3		III	Category A	
2615	ETHYL PROPYL ETHERS	3		II	Category E	
2616	TRIISOPROPYL BORATE	3		II	Category B	
2616	TRIISOPROPYL BORATE	3		III	Category A	
2617	METHYLCYCLOHEXANOLS flammable	3		III	Category A	
2618	VINYLTOLUENES, STABILIZED	3		III	Category A	
2619	BENZYLDIMETHYLAMINE	8	3	II	Category A SW1 SW2	
2620	AMYL BUTYRATES	3		III	Category A	
2621	ACETYL METHYL CARBINOL	3		III	Category A	
2622	GLYCIDALDEHYDE	3	6.1	II	Category A SW2	
2623	FIRELIGHTERS, SOLID with flammable liquid	4.1		III	Category A	SG35
2624	MAGNESIUM SILICIDE	4.3		II	Category B SW5 H1	
2626	CHLORIC ACID, AQUEOUS SOLUTION with not more than 10% chloric acid	5.1		II	Category D	SG38 SG49
2627	NITRITES, INORGANIC, N.O.S.	5.1		II	Category A	SG38 SG49 SG62
2628	POTASSIUM FLUOROACETATE	6.1		I	Category E	
2629	SODIUM FLUOROACETATE	6.1		I	Category E	
2630	SELENATES or SELENITES	6.1		I	Category E	
2642	FLUOROACETIC ACID	6.1		I	Category E	
2643	METHYL BROMOACETATE	6.1		II	Category D SW2	
2644	METHYL IODIDE	6.1		I	Category D SW1 SW2 H2	
2645	PHENACYL BROMIDE	6.1		II	Category B SW2	
2646	HEXACHLOROCYCLOPENTADIENE	6.1		I	Category D SW2	
2647	MALONONITRILE	6.1		II	Category A SW1 H2	
2648	1,2-DIBROMOBUTAN-3-ONE	6.1		II	Category B SW2	
2649	1,3-DICHLOROACETONE	6.1		II	Category B SW1 SW2 H2	
2650	1,1-DICHLORO-1-NITROETHANE	6.1		II	Category A SW1 SW2 H2	SG17

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2651	4,4'-DIAMINODIPHENYLMETHANE	6.1	P	III	Category A	
2653	BENZYL IODIDE	6.1		II	Category B SW2 H2	
2655	POTASSIUM FLUOROSILICATE	6.1		III	Category A	SG35
2656	QUINOLINE	6.1		III	Category A SW1 H2	
2657	SELENIUM DISULPHIDE	6.1		II	Category A	
2659	SODIUM CHLOROACETATE	6.1		III	Category A	
2660	NITROTOLUIDINES (MONO)	6.1		III	Category A	
2661	HEXACHLOROACETONE	6.1		III	Category B SW1 SW2 H2	
2664	DIBROMOMETHANE	6.1		III	Category A	
2667	BUTYLTOLUENES	6.1		III	Category A	
2668	CHLOROACETONITRILE	6.1	3	I	Category D SW1 SW2 H2	SG35
2669	CHLOROCRESOLS SOLUTION	6.1		II	Category A SW1 H2	
2669	CHLOROCRESOLS SOLUTION	6.1		III	Category A SW1 H2	
2670	CYANURIC CHLORIDE	8		II	Category A SW1 SW2 H2	
2671	AMINOPYRIDINES (o-, m-, p-)	6.1		II	Category B SW1 SW2 H2	SG35
2672	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15ºC in water, with more than 10% but not more than 35% ammonia	8		III	Category A SW2 SW5	SG35
2673	2-AMINO-4-CHLOROPHENOL	6.1		II	Category A	
2674	SODIUM FLUOROSILICATE	6.1		III	Category A	SG35
2676	STIBINE	2.3	2.1		Category D SW2	
2677	RUBIDIUM HYDROXIDE SOLUTION	8		II	Category A	SG22 SG35
2677	RUBIDIUM HYDROXIDE SOLUTION	8		III	Category A	SG22 SG35
2678	RUBIDIUM HYDROXIDE, SOLID	8		II	Category A	SG22 SG35
2679	LITHIUM HYDROXIDE SOLUTION	8		II	Category A	SG22 SG35
2679	LITHIUM HYDROXIDE SOLUTION	8		III	Category A	SG22 SG35
2680	LITHIUM HYDROXIDE	8		II	Category A	SG35
2681	CAESIUM HYDROXIDE SOLUTION	8		II	Category A	SG22 SG35
2681	CAESIUM HYDROXIDE SOLUTION	8		III	Category A	SG22 SG35
2682	CAESIUM HYDROXIDE	8		II	Category A	SG22 SG35

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2683	AMMONIUM SULPHIDE SOLUTION	8	3/6.1	II	Category B SW1 H2	SG35 SG68
2684	3-DIETHYLAMINOPROPYLAMINE	3	8	III	Category A	
2685	N,N-DIETHYLETHYLENEDIAMINE	8	3	II	Category A	
2686	2-DIETHYLAMINOETHANOL	8	3	II	Category A	
2687	DICYCLOHEXYLAMMONIUM NITRITE	4.1		III	Category A	
2688	1-BROMO-3-CHLOROPROPANE	6.1		III	Category A	
2689	GLYCEROL-alpha-MONOCHLOROHYDRIN	6.1		III	Category A	
2690	N,n-BUTYLIMIDAZOLE	6.1		II	Category A	
2691	PHOSPHORUS PENTABROMIDE	8		II	Category B SW1 SW2 H2	SG36 SG37
2692	BORON TRIBROMIDE	8		I	Category C SW1 H2	
2693	BISULPHITES, AQUEOUS SOLUTION, N.O.S.	8		III	Category A SW2	SG35
2698	TETRAHYDROPHTHALIC ANHYDRIDES with more than 0.05% maleic anhydride	8		III	Category A	
2699	TRIFLUOROACETIC ACID	8		I	Category B SW1 SW2 H2	
2705	1-PENTOL	8		II	Category B	SG20 SG21
2707	DIMETHYLDIOXANES	3		II	Category B	
2707	DIMETHYLDIOXANES	3		III	Category A	
2709	BUTYLBENZENES	3		III	Category A	
2710	DIPROPYL KETONE	3		III	Category A	
2713	ACRIDINE	6.1		III	Category A	
2714	ZINC RESINATE	4.1		III	Category A	
2715	ALUMINIUM RESINATE	4.1		III	Category A	
2716	1,4-BUTYNEDIOL	6.1		III	Category A	SG35 SG36 SG55
2717	CAMPHOR synthetic	4.1		III	Category A	
2719	BARIUM BROMATE	5.1	6.1	II	Category A	SG38 SG49
2720	CHROMIUM NITRATE	5.1		III	Category A	
2721	COPPER CHLORATE	5.1		II	Category A	SG38 SG49
2722	LITHIUM NITRATE	5.1		III	Category A	
2723	MAGNESIUM CHLORATE	5.1		II	Category A	SG38 SG49
2724	MANGANESE NITRATE	5.1		III	Category A	
2725	NICKEL NITRATE	5.1		III	Category A	
2726	NICKEL NITRITE	5.1		III	Category A	SG38 SG49
2727	THALLIUM NITRATE	6.1	5.1P	II	Category A	
2728	ZIRCONIUM NITRATE	5.1		III	Category A	

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2729	HEXACHLOROBENZENE	6.1		III	Category A	
2730	NITROANISOLES, LIQUID	6.1		III	Category A	
2732	NITROBROMOBENZENES, LIQUID	6.1		III	Category A	
2733	AMINES, FLAMMABLE, CORROSIVE, N.O.S. or POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S.	3	8	I	Category D SW2	SG35
2733	AMINES, FLAMMABLE, CORROSIVE, N.O.S. or POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S.	3	8	II	Category B SW2	SG35
2733	AMINES, FLAMMABLE, CORROSIVE, N.O.S. or POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S.	3	8	III	Category A SW2	SG35
2734	AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE	8	3	I	Category A	SG35
2734	AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE	8	3	II	Category A	SG35
2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8		I	Category A	SG35
2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8		II	Category A	SG35
2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8		III	Category A	SG35
2738	N-BUTYLANILINE	6.1		II	Category A	SG17
2739	BUTYRIC ANHYDRIDE	8		III	Category A	
2740	n-PROPYL CHLOROFORMATE	6.1	"3/8	I	Category B SW2	SG5 SG8
2741	BARIUM HYPOCHLORITE with more than 22% available chlorine	5.1	6.1	II	Category B	SG35 SG38 SG49 SG53 SG60
2742	CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.	6.1		II	Category A SW1 SW2 H1 H2	SG5 SG8
2743	n-BUTYL CHLOROFORMATE	6.1	"3/8	II	Category A SW1 SW2 H1 H2	SG5 SG8
2744	CYCLOBUTYL CHLOROFORMATE	6.1	"3/8	II	Category A SW1 SW2 H1 H2	SG5 SG8
2745	CHLOROMETHYL CHLOROFORMATE	6.1	8	II	Category A SW1 SW2 H1 H2	
2746	PHENYL CHLOROFORMATE	6.1	8	II	Category A SW1 SW2 H1 H2	
2747	tert-BUTYLCYCLOHEXYL CHLOROFORMATE	6.1		III	Category A SW1 H1 H2	

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2748	2-ETHYLHEXYL CHLOROFORMATE	6.1	8	II	Category A SW1 SW2 H1 H2	
2749	TETRAMETHYLSILANE	3		I	Category D	
2750	1,3-DICHLOROPROPANOL-2	6.1		II	Category A SW1 SW2 H2	
2751	DIETHYLTHIOPHOSPHORYL CHLORIDE	8		II	Category D SW1 SW2 H2	
2752	1,2-EPOXY-3-ETHOXYPROPANE	3		III	Category A	
2753	N-ETHYLBENZYLTOLUIDINES, LIQUID	6.1		III	Category A	
2754	N-ETHYLTOLUIDINES	6.1		II	Category A	
2757	CARBAMATE PESTICIDE, SOLID, TOXIC	6.1		I	Category A SW2	
2757	CARBAMATE PESTICIDE, SOLID, TOXIC	6.1		II	Category A SW2	
2757	CARBAMATE PESTICIDE, SOLID, TOXIC	6.1		III	Category A SW2	
2758	CARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	I	Category B SW2	
2758	CARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	II	Category B SW2	
2759	ARSENICAL PESTICIDE, SOLID, TOXIC	6.1		I	Category A SW2	
2759	ARSENICAL PESTICIDE, SOLID, TOXIC	6.1		II	Category A SW2	
2759	ARSENICAL PESTICIDE, SOLID, TOXIC	6.1		III	Category A SW2	
2760	ARSENICAL PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	I	Category B SW2	
2760	ARSENICAL PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	II	Category B SW2	
2761	ORGANOCHLORINE PESTICIDE, SOLID, TOXIC	6.1		I	Category A SW2	
2761	ORGANOCHLORINE PESTICIDE, SOLID, TOXIC	6.1		II	Category A SW2	
2761	ORGANOCHLORINE PESTICIDE, SOLID, TOXIC	6.1		III	Category A SW2	
2762	ORGANOCHLORINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	I	Category B SW2	
2762	ORGANOCHLORINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	II	Category B SW2	
2763	TRIAZINE PESTICIDE, SOLID, TOXIC	6.1		I	Category A SW2	
2763	TRIAZINE PESTICIDE, SOLID, TOXIC	6.1		II	Category A SW2	
2763	TRIAZINE PESTICIDE, SOLID, TOXIC	6.1		III	Category A SW2	
2764	TRIAZINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	I	Category B SW2	
2764	TRIAZINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	II	Category B SW2	

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2771	THIOCARBAMATE PESTICIDE, SOLID, TOXIC	6.1		I	Category A SW2	
2771	THIOCARBAMATE PESTICIDE, SOLID, TOXIC	6.1		II	Category A SW2	
2771	THIOCARBAMATE PESTICIDE, SOLID, TOXIC	6.1		III	Category A SW2	
2772	THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	I	Category B SW2	
2772	THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	II	Category B SW2	
2775	COPPER BASED PESTICIDE, SOLID, TOXIC	6.1		I	Category A SW2	
2775	COPPER BASED PESTICIDE, SOLID, TOXIC	6.1		II	Category A SW2	
2775	COPPER BASED PESTICIDE, SOLID, TOXIC	6.1		III	Category A SW2	
2776	COPPER BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	I	Category B SW2	
2776	COPPER BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	II	Category B SW2	
2777	MERCURY BASED PESTICIDE, SOLID, TOXIC	6.1	P	I	Category A SW2	
2777	MERCURY BASED PESTICIDE, SOLID, TOXIC	6.1	P	II	Category A SW2	
2777	MERCURY BASED PESTICIDE, SOLID, TOXIC	6.1	P	III	Category A SW2	
2778	MERCURY BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1P	I	Category B SW2	
2778	MERCURY BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1P	II	Category B SW2	
2779	SUBSTITUTED NITROPHENOL PESTICIDE, SOLID, TOXIC	6.1		I	Category A SW2	
2779	SUBSTITUTED NITROPHENOL PESTICIDE, SOLID, TOXIC	6.1		II	Category A SW2	
2779	SUBSTITUTED NITROPHENOL PESTICIDE, SOLID, TOXIC	6.1		III	Category A SW2	
2780	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	I	Category B SW2	
2780	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	II	Category B SW2	
2781	BIPYRIDILIUM PESTICIDE, SOLID, TOXIC	6.1		I	Category A SW2	
2781	BIPYRIDILIUM PESTICIDE, SOLID, TOXIC	6.1		II	Category A SW2	
2781	BIPYRIDILIUM PESTICIDE, SOLID, TOXIC	6.1		III	Category A SW2	
2782	BIPYRIDILIUM PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	I	Category B SW2	
2782	BIPYRIDILIUM PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	II	Category B SW2	
2783	ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC	6.1		I	Category A SW2	
2783	ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC	6.1		II	Category A SW2	

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2783	ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC	6.1		III	Category A SW2	
2784	ORGANOPHOSPHORUS PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	I	Category B SW2	
2784	ORGANOPHOSPHORUS PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1	II	Category B SW2	
2785	4-THIAPENTANAL	6.1		III	Category D SW1	SG20 SG21
2786	ORGANOTIN PESTICIDE, SOLID, TOXIC	6.1	P	I	Category A SW2	
2786	ORGANOTIN PESTICIDE, SOLID, TOXIC	6.1	P	II	Category A SW2	
2786	ORGANOTIN PESTICIDE, SOLID, TOXIC	6.1	P	III	Category A SW2	
2787	ORGANOTIN PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1P	I	Category B SW2	
2787	ORGANOTIN PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23ºC	3	6.1P	II	Category B SW2	
2788	ORGANOTIN COMPOUND, LIQUID, N.O.S.	6.1	P	I	Category A SW2	
2788	ORGANOTIN COMPOUND, LIQUID, N.O.S.	6.1	P	II	Category A SW2	
2788	ORGANOTIN COMPOUND, LIQUID, N.O.S.	6.1	P	III	Category A SW2	
2789	ACETIC ACID, GLACIAL or ACETIC ACID SOLUTION, more than 80% acid, by mass	8	3	II	Category A	
2790	ACETIC ACID SOLUTION not less than 50% but not more than 80% acid, by mass	8		II	Category A	
2790	ACETIC ACID SOLUTION more than 10% and less than 50% acid, by mass	8		III	Category A	
2793	FERROUS METAL BORINGS, SHAVINGS, TURNINGS, or CUTTINGS in a form liable to self-heating	4.2		III	Category A	
2794	BATTERIES, WET, FILLED WITH ACID electric storage	8			Category A SW16	
2795	BATTERIES, WET, FILLED WITH ALKALI electric storage	8			Category A SW16	SG35
2796	SULPHURIC ACID with not more than 51% acid or BATTERY FLUID, ACID	8		II	Category B	
2797	BATTERY FLUID, ALKALI	8		II	Category A	SG22 SG35
2798	PHENYLPHOSPHORUS DICHLORIDE	8		II	Category B SW2	
2799	PHENYLPHOSPHORUS THIODICHLORIDE	8		II	Category B SW2	
2800	BATTERIES, WET, NON-SPILLABLE electric storage	8			Category A	
2801	DYE, LIQUID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, LIQUID, CORROSIVE, N.O.S.	8		I	Category A	
2801	DYE, LIQUID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, LIQUID, CORROSIVE, N.O.S.	8		II	Category A	
2801	DYE, LIQUID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, LIQUID, CORROSIVE, N.O.S.	8		III	Category A	
2802	COPPER CHLORIDE	8	P	III	Category A	
2803	GALLIUM	8		III	Category B SW1	

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2805	LITHIUM HYDRIDE, FUSED SOLID	4.3		II	Category E	SG35
2806	LITHIUM NITRIDE	4.3		I	Category E	
2807	MAGNETIZED MATERIAL	9		III	-	
2809	MERCURY	8	6.1	III	Category B SW2	SG24
2810	TOXIC LIQUID, ORGANIC, N.O.S.	6.1		I	Category B SW2	
2810	TOXIC LIQUID, ORGANIC, N.O.S.	6.1		II	Category B SW2	
2810	TOXIC LIQUID, ORGANIC, N.O.S.	6.1		III	Category A SW2	
2811	TOXIC SOLID, ORGANIC, N.O.S.	6.1		I	Category B	
2811	TOXIC SOLID, ORGANIC, N.O.S.	6.1		II	Category B	
2811	TOXIC SOLID, ORGANIC, N.O.S.	6.1		III	Category A	
2812	SODIUM ALUMINATE, SOLID	8			-	
2813	WATER-REACTIVE SOLID, N.O.S.	4.3		I	Category E SW2	
2813	WATER-REACTIVE SOLID, N.O.S.	4.3		II	Category E SW2	
2813	WATER-REACTIVE SOLID, N.O.S.	4.3		III	Category E SW2	
2814	INFECTIOUS SUBSTANCE, AFFECTING HUMANS	6.2			SW7	
2815	N-AMINOETHYLPIPERAZINE	8		III	Category A SW1 H2	
2817	AMMONIUM HYDROGENDIFLUORIDE SOLUTION	8	6.1	II	Category B SW2	
2817	AMMONIUM HYDROGENDIFLUORIDE SOLUTION	8	6.1	III	Category B SW2	
2818	AMMONIUM POLYSULPHIDE SOLUTION	8	6.1	II	Category B SW1 SW2 H2	SG35
2818	AMMONIUM POLYSULPHIDE SOLUTION	8	6.1	III	Category B SW1 SW2 H2	SG35
2819	AMYL ACID PHOSPHATE	8		III	Category A	
2820	BUTYRIC ACID	8		III	Category A SW1 H2	
2821	PHENOL SOLUTION	6.1		II	Category A	
2821	PHENOL SOLUTION	6.1		III	Category A	
2822	2-CHLOROPYRIDINE	6.1		II	Category A SW2	
2823	CROTONIC ACID, SOLID	8		III	Category A SW1 H2	
2826	ETHYL CHLOROTHIOFORMATE	8	3P	II	Category A SW2	
2829	CAPROIC ACID	8		III	Category A	
2830	LITHIUM FERROSILICON	4.3		II	Category E SW2 SW5 H1	
2831	1,1,1-TRICHLOROETHANE	6.1		III	Category A SW2	
2834	PHOSPHOROUS ACID	8		III	Category A SW1	

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2835	SODIUM ALUMINIUM HYDRIDE	4.3		II	Category E	SG35
2837	BISULPHATES, AQUEOUS SOLUTION	8		II	Category A	
2837	BISULPHATES, AQUEOUS SOLUTION	8		III	Category A	
2838	VINYL BUTYRATE, STABILIZED	3		II	Category B	
2839	ALDOL	6.1		II	Category A SW1 H2	
2840	BUTYRALDOXIME	3		III	Category A	
2841	DI-n-AMYLAMINE	3	6.1	III	Category A	
2842	NITROETHANE	3		III	Category A	
2844	CALCIUM MANGANESE SILICON	4.3		III	Category A SW5 H1	SG35
2845	PYROPHORIC LIQUID, ORGANIC, N.O.S.	4.2		I	Category D	SG63
2846	PYROPHORIC SOLID, ORGANIC, N.O.S.	4.2		I	Category D	
2849	3-CHLOROPROPANOL-1	6.1		III	Category A	
2850	PROPYLENE TETRAMER	3		III	Category A	
2851	BORON TRIFLUORIDE DIHYDRATE	8		II	Category B SW1 SW2 H2	
2852	DIPICRYL SULPHIDE, WETTED with not less than 10% water, by mass	4.1		I	Category D	SG7 SG30
2853	MAGNESIUM FLUOROSILICATE	6.1		III	Category A	SG35
2854	AMMONIUM FLUOROSILICATE	6.1		III	Category A	SG35
2855	ZINC FLUOROSILICATE	6.1		III	Category A	SG35
2856	FLUOROSILICATES, N.O.S.	6.1		III	Category A	SG35
2857	REFRIGERATING MACHINES containing non-flammable, non-toxic gases or ammonia solution (UN2672)	2.2			Category A	
2858	ZIRCONIUM, DRY coiled wire, finished metal sheets, strip (thinner than 254 microns but not thinner than 18 microns)	4.1		III	Category A	
2859	AMMONIUM METAVANADATE	6.1		II	Category A	SG6 SG8 SG10 SG12
2861	AMMONIUM POLYVANADATE	6.1		II	Category A	SG6 SG8 SG10 SG12
2862	VANADIUM PENTOXIDE, non-fused form	6.1		III	Category A	
2863	SODIUM AMMONIUM VANADATE	6.1		II	Category A	
2864	POTASSIUM METAVANADATE	6.1		II	Category A	
2865	HYDROXYLAMINE SULPHATE	8		III	Category A	
2869	TITANIUM TRICHLORIDE MIXTURE	8		II	Category A SW2	
2869	TITANIUM TRICHLORIDE MIXTURE	8		III	Category A SW2	
2870	ALUMINIUM BOROHYDRIDE	4.2	4.3	I	Category D	
2870	ALUMINIUM BOROHYDRIDE IN DEVICES	4.2	4.3	I	Category D	
2871	ANTIMONY POWDER	6.1		III	Category A	
2872	DIBROMOCHLOROPROPANES	6.1		II	Category A	
2872	DIBROMOCHLOROPROPANES	6.1		III	Category A	

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2873	N,N-DI-n-BUTYLAMINOETHANOL	6.1		III	Category A	
2874	FURFURYL ALCOHOL	6.1		III	Category A	SG17 SG35
2875	HEXACHLOROPHENE	6.1		III	Category A	
2876	RESORCINOL	6.1		III	Category A	
2878	TITANIUM, SPONGE GRANULES or TITANIUM, SPONGE POWDERS	4.1		III	Category D	SG17
2879	SELENIUM OXYCHLORIDE	8	6.1	I	Category E SW2	
2880	CALCIUM HYPOCHLORITE, HYDRATED or CALCIUM HYPOCHLORITE, HYDRATED MIXTURE with not less than 5.5% but not more than 16% water	5.1		II	Category D SW1 SW11	SG35 SG38 SG49 SG53 SG60
2880	CALCIUM HYPOCHLORITE, HYDRATED or CALCIUM HYPOCHLORITE, HYDRATED MIXTURE with not less than 5.5% but not more than 16% water	5.1		III	Category D SW1 SW11	SG35 SG38 SG49 SG53 SG60
2881	METAL CATALYST, DRY	4.2		I	Category C	
2881	METAL CATALYST, DRY	4.2		II	Category C	
2881	METAL CATALYST, DRY	4.2		III	Category C	
2900	INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only	6.2			SW7	
2901	BROMINE CHLORIDE	2.3	5.1/8		Category D SW2	SG6 SG19
2902	PESTICIDE, LIQUID, TOXIC, N.O.S.	6.1		I	Category B SW2	
2902	PESTICIDE, LIQUID, TOXIC, N.O.S.	6.1		II	Category B SW2	
2902	PESTICIDE, LIQUID, TOXIC, N.O.S.	6.1		III	Category A SW2	
2903	PESTICIDE, LIQUID, TOXIC, FLAMMABLE, N.O.S. flashpoint not less than 23ºC	6.1	3	I	Category B SW2	
2903	PESTICIDE, LIQUID, TOXIC, FLAMMABLE, N.O.S. flashpoint not less than 23ºC	6.1	3	II	Category B SW2	
2903	PESTICIDE, LIQUID, TOXIC, FLAMMABLE, N.O.S. flashpoint not less than 23ºC	6.1	3	III	Category A SW2	
2904	CHLOROPHENOLATES, LIQUID or PHENOLATES, LIQUID	8		III	Category A	
2905	CHLOROPHENOLATES, SOLID or PHENOLATES, SOLID	8		III	Category A	
2907	ISOSORBIDE DINITRATE MIXTURE with not less than 60% lactose, mannose, starch, or calcium	4.1		II	Category E	SG7 SG30
2908	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - EMPTY PACKAGING	7	See SP290		Category A	
2909	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - ARTICLES MANUFACTURED FROM NATURAL URANIUM or D	7	See SP290		Category A	
2910	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY OF MATERIAL	7	See SP290		Category A	
2911	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - INSTRUMENTS or ARTICLES	7	See SP290		Category A	
2912	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), non fissile or fissile-excepted	7	See SP172		Category A SW20	

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2913	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS(SCO-I or SCO-II), non fissile or fis	7	See SP172		Category A	
2915	RADIOACTIVE MATERIAL, TYPE A PACKAGE, non-special form, non fissile or fissile-excepted	7	See SP172		Category A SW20 SW21	
2916	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, non fissile or fissile-excepted	7	See SP172		Category A SW12	
2917	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, non fissile or fissile-excepted	7	See SP172		Category A SW12	
2919	RADIOACTIVE MATERIAL TRANSPORTED UNDER SPECIAL ARRANGEMENT, non fissile or fissile-excep	7	See SP172		Category A SW13	
2920	CORROSIVE LIQUID, FLAMMABLE, N.O.S.	8	3	I	Category C SW1 SW2	
2920	CORROSIVE LIQUID, FLAMMABLE, N.O.S.	8	3	II	Category C SW1 SW2	
2921	CORROSIVE SOLID, FLAMMABLE, N.O.S.	8	4.1	I	Category B SW1 H2	
2921	CORROSIVE SOLID, FLAMMABLE, N.O.S.	8	4.1	II	Category B SW1 H2	
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	6.1	I	Category B SW2	
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	6.1	II	Category B SW2	
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	6.1	III	Category B SW2	
2923	CORROSIVE SOLID, TOXIC, N.O.S.	8	6.1	I	Category B SW2	
2923	CORROSIVE SOLID, TOXIC, N.O.S.	8	6.1	II	Category B SW2	
2923	CORROSIVE SOLID, TOXIC, N.O.S.	8	6.1	III	Category B SW2	
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S.	3	8	I	Category E SW2	
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S.	3	8	II	Category B SW2	
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S.	3	8	III	Category A SW2	
2925	FLAMMABLE SOLID, CORROSIVE, ORGANIC, N.O.S.	4.1	8	II	Category D SW2	
2925	FLAMMABLE SOLID, CORROSIVE, ORGANIC, N.O.S.	4.1	8	III	Category D SW2	
2926	FLAMMABLE SOLID, TOXIC, ORGANIC, N.O.S.	4.1	6.1	II	Category B SW2	
2926	FLAMMABLE SOLID, TOXIC, ORGANIC, N.O.S.	4.1	6.1	III	Category B SW2	
2927	TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S.	6.1	8	I	Category B SW2	
2927	TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S.	6.1	8	II	Category B SW2	
2928	TOXIC SOLID, CORROSIVE, ORGANIC, N.O.S.	6.1	8	I	Category B SW2	
2928	TOXIC SOLID, CORROSIVE, ORGANIC, N.O.S.	6.1	8	II	Category B SW2	

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2929	TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.	6.1	3	I	Category B SW2	
2929	TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.	6.1	3	II	Category B SW2	
2930	TOXIC SOLID, FLAMMABLE, ORGANIC, N.O.S.	6.1	4.1	I	Category B	
2930	TOXIC SOLID, FLAMMABLE, ORGANIC, N.O.S.	6.1	4.1	II	Category B	
2931	VANADYL SULPHATE	6.1		II	Category A	
2933	METHYL 2-CHLOROPROPIONATE	3		III	Category A	
2934	ISOPROPYL 2-CHLOROPROPIONATE	3		III	Category A	
2935	ETHYL 2-CHLOROPROPIONATE	3		III	Category A	
2936	THIOLACTIC ACID	6.1		II	Category A	
2937	alpha-METHYLBENZYL ALCOHOL, LIQUID	6.1		III	Category A	
2940	9-PHOSPHABICYCLONONANES (CYCLOOCTADIENE PHOSPHINES)	4.2		II	Category A	
2941	FLUOROANILINES	6.1		III	Category A	
2942	2-TRIFLUOROMETHYLANILINE	6.1		III	Category A	
2943	TETRAHYDROFURFURYLAMINE	3		III	Category A	
2945	N-METHYLBUTYLAMINE	3	8	II	Category B SW2	
2946	2-AMINO-5-DIETHYLAMINOPENTANE	6.1		III	Category A	
2947	ISOPROPYL CHLOROACETATE	3		III	Category A	
2948	3-TRIFLUOROMETHYLANILINE	6.1		II	Category A SW2	
2949	SODIUM HYDROSULPHIDE, HYDRATED with not less than 25% water of crystallization	8		II	Category A	SG35
2950	MAGNESIUM GRANULES, COATED particle size not less than 149 microns	4.3		III	Category A	SG35
2956	5-tert-BUTYL-2,4,6-TRINITRO-m-XYLENE (MUSK XYLENE)	4.1		III	Category D SW1 SW2 H2 H3	SG1
2965	BORON TRIFLUORIDE DIMETHYL ETHERATE	4.3	"3/8	I	Category D SW2	SG5 SG7 SG8 SG13
2966	THIOGLYCOL	6.1		II	Category A	
2967	SULPHAMIC ACID	8		III	Category A	
2968	MANEB, STABILIZED or MANEB PREPARATION, STABILIZED against self-heating	4.3		III	Category B	SG29 SG35
2969	CASTOR BEANS or CASTOR MEAL or CASTOR POMACE or CASTOR FLAKE	9		II	Category E SW2	SG10 SG18 SG29
2977	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE	7	8		Category A SW12	
2978	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE non fissile or fissile-excepted	7	8		Category A SW12	
2983	ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE with not more than 30% ethylene oxide	3	6.1	I	Category E SW2	
2984	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 8% but less than 20% hydrogen peroxide (stabilized as necessary)	5.1		III	Category B SW1	SG16 SG59 SG72

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2985	CHLOROSILANES, FLAMMABLE, CORROSIVE, N.O.S.	3	8	II	Category B SW2	
2986	CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S.	8	3	II	Category C SW2	
2987	CHLOROSILANES, CORROSIVE, N.O.S.	8		II	Category C SW2	
2988	CHLOROSILANES, WATER-REACTIVE, FLAMMABLE, CORROSIVE, N.O.S.	4.3	"3/8	I	Category D SW2	SG5 SG7 SG8 SG13
2989	LEAD PHOSPHITE, DIBASIC	4.1		II	Category B	SG29
2989	LEAD PHOSPHITE, DIBASIC	4.1		III	Category B	SG29
2990	LIFE-SAVING APPLIANCES, SELF-INFLATING	9			Category A	SG18 SG71
2991	CARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23ºC	6.1	3	I	Category B SW2	
2991	CARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23ºC	6.1	3	II	Category B SW2	
2991	CARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23ºC	6.1	3	III	Category A SW2	
2992	CARBAMATE PESTICIDE, LIQUID, TOXIC	6.1		I	Category B SW2	
2992	CARBAMATE PESTICIDE, LIQUID, TOXIC	6.1		II	Category B SW2	
2992	CARBAMATE PESTICIDE, LIQUID, TOXIC	6.1		III	Category A SW2	
2993	ARSENICAL PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	I	Category B SW2	
2993	ARSENICAL PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	II	Category B SW2	
2993	ARSENICAL PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	III	Category A SW2	
2994	ARSENICAL PESTICIDE, LIQUID, TOXIC	6.1		I	Category B SW2	
2994	ARSENICAL PESTICIDE, LIQUID, TOXIC	6.1		II	Category B SW2	
2994	ARSENICAL PESTICIDE, LIQUID, TOXIC	6.1		III	Category A SW2	
2995	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	I	Category B SW2	
2995	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	II	Category B SW2	
2995	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	III	Category A SW2	
2996	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC	6.1		I	Category B SW2	
2996	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC	6.1		II	Category B SW2	
2996	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC	6.1		III	Category A SW2	
2997	TRIAZINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23ºC	6.1	3	I	Category B SW2	
2997	TRIAZINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23ºC	6.1	3	II	Category B SW2	

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2997	TRIAZINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23ºC	6.1	3	III	Category A SW2	
2998	TRIAZINE PESTICIDE, LIQUID, TOXIC	6.1		I	Category B SW2	
2998	TRIAZINE PESTICIDE, LIQUID, TOXIC	6.1		II	Category B SW2	
2998	TRIAZINE PESTICIDE, LIQUID, TOXIC	6.1		III	Category A SW2	
3005	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	I	Category B SW2	
3005	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	II	Category B SW2	
3005	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	III	Category A SW2	
3006	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC	6.1		I	Category B SW2	
3006	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC	6.1		II	Category B SW2	
3006	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC	6.1		III	Category A SW2	
3009	COPPER BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1		I	Category B SW2	
3009	COPPER BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	II	Category B SW2	
3009	COPPER BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	III	Category A SW2	
3010	COPPER BASED PESTICIDE, LIQUID, TOXIC	6.1		I	Category B SW2	
3010	COPPER BASED PESTICIDE, LIQUID, TOXIC	6.1		II	Category B SW2	
3010	COPPER BASED PESTICIDE, LIQUID, TOXIC	6.1		III	Category A SW2	
3011	MERCURY BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3P	I	Category B SW2	
3011	MERCURY BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3P	II	Category B SW2	
3011	MERCURY BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3P	III	Category A SW2	
3012	MERCURY BASED PESTICIDE, LIQUID, TOXIC	6.1	P	I	Category B SW2	
3012	MERCURY BASED PESTICIDE, LIQUID, TOXIC	6.1	P	II	Category B SW2	
3012	MERCURY BASED PESTICIDE, LIQUID, TOXIC	6.1	P	III	Category A SW2	
3013	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23º	6.1	3	I	Category B SW2	
3013	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23º	6.1	3	II	Category B SW2	
3013	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23º	6.1	3	III	Category A SW2	
3014	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC	6.1		I	Category B SW2	
3014	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC	6.1		II	Category B SW2	

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3014	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC	6.1		III	Category A SW2	
3015	BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1		I	Category B SW2	
3015	BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	II	Category B SW2	
3015	BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	III	Category A SW2	
3016	BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC	6.1		I	Category B SW2	
3016	BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC	6.1		II	Category B SW2	
3016	BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC	6.1		III	Category A SW2	
3017	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	I	Category B SW2	
3017	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	II	Category B SW2	
3017	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	III	Category A SW2	
3018	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC	6.1		I	Category B SW2	
3018	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC	6.1		II	Category B SW2	
3018	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC	6.1		III	Category A SW2	
3019	ORGANOTIN PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3P	I	Category B SW2	
3019	ORGANOTIN PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3P	II	Category B SW2	
3019	ORGANOTIN PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3P	III	Category A SW2	
3020	ORGANOTIN PESTICIDE, LIQUID, TOXIC	6.1	P	I	Category B SW2	
3020	ORGANOTIN PESTICIDE, LIQUID, TOXIC	6.1	P	II	Category B SW2	
3020	ORGANOTIN PESTICIDE, LIQUID, TOXIC	6.1	P	III	Category A SW2	
3021	PESTICIDE, LIQUID, FLAMMABLE, TOXIC, N.O.S. flashpoint less than 23ºC	3	6.1	I	Category B SW2	
3021	PESTICIDE, LIQUID, FLAMMABLE, TOXIC, N.O.S. flashpoint less than 23ºC	3	6.1	II	Category B SW2	
3022	1,2-BUTYLENE OXIDE, STABILIZED	3		II	Category B	SG20 SG21
3023	2-METHYL-2-HEPTANETHIOL	6.1	3	I	Category D SW2	SG57
3024	COUMARIN DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flashpoint less than 23ºC	3	6.1	I	Category B SW2	
3024	COUMARIN DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flashpoint less than 23ºC	3	6.1	II	Category B SW2	
3025	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	I	Category B SW2	

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3025	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	II	Category B SW2	
3025	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23ºC	6.1	3	III	Category A SW2	
3026	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1		I	Category B SW2	
3026	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1		II	Category B SW2	
3026	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1		III	Category A SW2	
3027	COUMARIN DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1		I	Category A SW2	
3027	COUMARIN DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1		II	Category A SW2	
3027	COUMARIN DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1		III	Category A SW2	
3028	BATTERIES, DRY, CONTAINING POTASSIUM HYDROXIDE, SOLID electric storage	8		III	Category A	SG35
3048	ALUMINIUM PHOSPHIDE PESTICIDE	6.1		I	Category E SW2 SW5	
3054	CYCLOHEXANETHIOL (CYCLOHEXYL MERCAPTAN)	3		III	Category A SW2	SG50 SG57
3055	2-(2-AMINOETHOXY) ETHANOL	8	8	III	Category A	
3056	n-HEPTALDEHYDE	3		III	Category A	
3057	TRIFLUOROACETYL CHLORIDE	2.3	8		Category D SW2	
3064	NITROGLYCERIN SOLUTION IN ALCOHOL with more than 1% but not more than 5% nitroglycerin	3		II	Category E	
3065	ALCOHOLIC BEVERAGES, with more than 70% alcohol by volume	3		II	Category A	
3065	ALCOHOLIC BEVERAGES, with more than 24% but not more than 70% alcohol by volume	3		III	Category A	
3066	PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler	8		II	Category B SW2	
3066	PAINT (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler	8		III	Category A SW2	
3070	ETHYLENE OXIDE AND DICHLORODIFLUOROMETHANE MIXTURE with not more than 12.5% ethylene oxi	2.2			Category A	
3071	MERCAPTANS, LIQUID, TOXIC, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, TOXIC, FLAMMA	6.1	3	II	Category C SW2	SG57
3072	LIFE-SAVING APPLIANCES, NOT SELF-INFLATING containing dangerous goods as equipment	9			Category A	SG18 SG71
3073	VINYLPYRIDINES, STABILIZED	6.1	"3/8	II	Category C SW2	SG5 SG8 SG35
3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.	9		III	Category A SW23	
3078	CERIUM turnings or gritty powder	4.3		II	Category E	SG35
3079	METHACRYLONITRILE, STABILIZED	6.1	3	I	Category D SW2	

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3080	ISOCYANATES, TOXIC, FLAMMABLE, N.O.S or ISOCYANATE SOLUTION, TOXIC, FLAMMABLE, N.O.S.	6.1	3	II	Category D SW1 SW2	
3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	9		III	Category A	
3083	PERCHLORYL FLUORIDE	2.3	5.1		Category D SW2	
3084	CORROSIVE SOLID, OXIDIZING, N.O.S.	8	5.1	I	Category C	
3084	CORROSIVE SOLID, OXIDIZING, N.O.S.	8	5.1	II	Category C	
3085	OXIDIZING SOLID, CORROSIVE, N.O.S.	5.1	8	I	Category D H1	SG38 SG49 SG60
3085	OXIDIZING SOLID, CORROSIVE, N.O.S.	5.1	8	II	Category B H1	SG38 SG49 SG60
3085	OXIDIZING SOLID, CORROSIVE, N.O.S.	5.1	8	III	Category B H1	SG38 SG49 SG60
3086	TOXIC SOLID, OXIDIZING, N.O.S.	6.1	5.1	I	Category C	
3086	TOXIC SOLID, OXIDIZING, N.O.S.	6.1	5.1	II	Category C	
3087	OXIDIZING SOLID, TOXIC, N.O.S.	5.1	5.1	I	Category D	SG38 SG49 SG60
3087	OXIDIZING SOLID, TOXIC, N.O.S.	5.1	6.1	II	Category B	SG38 SG49 SG60
3087	OXIDIZING SOLID, TOXIC, N.O.S.	5.1	6.1	III	Category B	SG38 SG49 SG60
3088	SELF-HEATING SOLID, ORGANIC, N.O.S.	4.2		II	Category C	
3088	SELF-HEATING SOLID, ORGANIC, N.O.S.	4.2		III	Category C	
3089	METAL POWDER, FLAMMABLE, N.O.S.	4.1		II	Category B	SG17
3089	METAL POWDER, FLAMMABLE, N.O.S.	4.1		III	Category B	SG17
3090	LITHIUM METAL BATTERIES (including lithium alloy batteries)	9		II	Category A	
3091	LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT or LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT (including lithium alloy batteries)	9		II	Category A	
3092	1-METHOXY-2-PROPANOL	3		III	Category A	
3093	CORROSIVE LIQUID, OXIDIZING, N.O.S.	8	5.1	I	Category C	
3093	CORROSIVE LIQUID, OXIDIZING, N.O.S.	8	5.1	II	Category C	
3094	CORROSIVE LIQUID, WATER-REACTIVE, N.O.S.	8	4.3	I	Category D	
3094	CORROSIVE LIQUID, WATER-REACTIVE, N.O.S.	8	4.3	II	Category D	
3095	CORROSIVE SOLID, SELF-HEATING, N.O.S.	8	4.2	I	Category D	
3095	CORROSIVE SOLID, SELF-HEATING, N.O.S.	8	4.2	II	Category D	
3096	CORROSIVE SOLID, WATER-REACTIVE, N.O.S.	8	4.3	I	Category D	
3096	CORROSIVE SOLID, WATER-REACTIVE, N.O.S.	8	4.3	II	Category D	
3097	FLAMMABLE SOLID, OXIDIZING, N.O.S.	4.1	5.1	II	-	
3097	FLAMMABLE SOLID, OXIDIZING, N.O.S.	4.1	5.1	III	-	
3098	OXIDIZING LIQUID, CORROSIVE, N.O.S.	5.1	8	I	Category D H1	SG38 SG49 SG60

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3098	OXIDIZING LIQUID, CORROSIVE, N.O.S.	5.1	8	II	Category B H1	SG38 SG49 SG60
3098	OXIDIZING LIQUID, CORROSIVE, N.O.S.	5.1	8	III	Category B H1	SG38 SG49 SG60
3099	OXIDIZING LIQUID, TOXIC, N.O.S.	5.1	6.1	I	Category D	SG38 SG49 SG60
3099	OXIDIZING LIQUID, TOXIC, N.O.S.	5.1	6.1	II	Category B	SG38 SG49 SG60
3099	OXIDIZING LIQUID, TOXIC, N.O.S.	5.1	6.1	III	Category B	SG38 SG49 SG60
3100	OXIDIZING SOLID, SELF-HEATING, N.O.S.	5.1	4.2	I	-	
3100	OXIDIZING SOLID, SELF-HEATING, N.O.S.	5.1	4.2	II	-	
3101	ORGANIC PEROXIDE TYPE B, LIQUID	5.2	See SP181		Category D SW1	SG1 SG35 SG36
3102	ORGANIC PEROXIDE TYPE B, SOLID	5.2	See SP181		Category D SW1	SG1 SG35 SG36
3103	ORGANIC PEROXIDE TYPE C, LIQUID	5.2			Category D SW1	SG35 SG36
3104	ORGANIC PEROXIDE TYPE C, SOLID	5.2			Category D SW1	SG35 SG36
3105	ORGANIC PEROXIDE TYPE D, LIQUID	5.2			Category D SW1	SG35 SG36 SG72
3106	ORGANIC PEROXIDE TYPE D, SOLID	5.2			Category D SW1	SG35 SG36
3107	ORGANIC PEROXIDE TYPE E, LIQUID	5.2			Category D SW1	SG35 SG36 SG72
3108	ORGANIC PEROXIDE TYPE E, SOLID	5.2			Category D SW1	SG35 SG36
3109	ORGANIC PEROXIDE TYPE F, LIQUID	5.2			Category D SW1	SG35 SG36 SG72
3110	ORGANIC PEROXIDE TYPE F, SOLID	5.2			Category D SW1	SG35 SG36
3111	ORGANIC PEROXIDE TYPE B, LIQUID, TEMPERATURE CONTROLLED	5.2			Category D SW1 SW3	SG1 SG35 SG36
3112	ORGANIC PEROXIDE TYPE B, SOLID, TEMPERATURE CONTROLLED	5.2	See SP181		Category D SW1 SW3	SG1 SG35 SG36
3113	ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED	5.2			Category D SW1 SW3	SG35 SG36
3114	ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED	5.2			Category D SW1 SW3	SG35 SG36
3115	ORGANIC PEROXIDE TYPE D, LIQUID, TEMPERATURE CONTROLLED	5.2			Category D SW1 SW3	SG35 SG36
3116	ORGANIC PEROXIDE TYPE D, SOLID, TEMPERATURE CONTROLLED	5.2			Category D SW1 SW3	SG35 SG36
3117	ORGANIC PEROXIDE TYPE E, LIQUID, TEMPERATURE CONTROLLED	5.2			Category D SW1 SW3	SG35 SG36
3118	ORGANIC PEROXIDE TYPE E, SOLID, TEMPERATURE CONTROLLED	5.2			Category D SW1 SW3	SG35 SG36

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3119	ORGANIC PEROXIDE TYPE F, LIQUID, TEMPERATURE CONTROLLED	5.2			Category D SW1 SW3	SG35 SG36
3120	ORGANIC PEROXIDE TYPE F, SOLID, TEMPERATURE CONTROLLED	5.2			Category D SW1 SW3	SG35 SG36
3121	OXIDIZING SOLID, WATER-REACTIVE, N.O.S.	5.1	4.3	I	-	
3121	OXIDIZING SOLID, WATER-REACTIVE, N.O.S.	5.1	4.3	II	-	
3122	TOXIC LIQUID, OXIDIZING, N.O.S.	6.1	5.1	I	Category C	
3122	TOXIC LIQUID, OXIDIZING, N.O.S.	6.1	5.1	II	Category C	
3123	TOXIC LIQUID, WATER-REACTIVE, N.O.S.	6.1	4.3	I	Category D SW2	
3123	TOXIC LIQUID, WATER-REACTIVE, N.O.S.	6.1	4.3	II	Category D SW2	
3124	TOXIC SOLID, SELF-HEATING, N.O.S.	6.1	4.2	I	Category D SW2	
3124	TOXIC SOLID, SELF-HEATING, N.O.S.	6.1	4.2	II	Category D SW2	
3125	TOXIC SOLID, WATER-REACTIVE, N.O.S.	6.1	4.3	I	Category D SW2	
3125	TOXIC SOLID, WATER-REACTIVE, N.O.S.	6.1	4.3	II	Category D SW2	
3126	SELF-HEATING SOLID, CORROSIVE, ORGANIC, N.O.S.	4.2	8	II	Category C	
3126	SELF-HEATING SOLID, CORROSIVE, ORGANIC, N.O.S.	4.2	8	III	Category C	
3127	SELF-HEATING SOLID, OXIDIZING, N.O.S.	4.2	5.1	II	-	
3127	SELF-HEATING SOLID, OXIDIZING, N.O.S.	4.2	5.1	III	-	
3128	SELF-HEATING SOLID, TOXIC, ORGANIC, N.O.S.	4.2	6.1	II	Category C	
3128	SELF-HEATING SOLID, TOXIC, ORGANIC, N.O.S.	4.2	6.1	III	Category C	
3129	WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.	4.3	8	I	Category D	
3129	WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.	4.3	8	II	Category E SW5	
3129	WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.	4.3	8	III	Category E	
3130	WATER-REACTIVE LIQUID, TOXIC, N.O.S.	4.3	6.1	I	Category D	
3130	WATER-REACTIVE LIQUID, TOXIC, N.O.S.	4.3	6.1	II	Category E SW5	
3130	WATER-REACTIVE LIQUID, TOXIC, N.O.S.	4.3	6.1	III	Category E SW5	
3131	WATER-REACTIVE SOLID, CORROSIVE, N.O.S.	4.3	8	I	Category D	
3131	WATER-REACTIVE SOLID, CORROSIVE, N.O.S.	4.3	8	II	Category E SW5	
3131	WATER-REACTIVE SOLID, CORROSIVE, N.O.S.	4.3	8	III	Category E SW5	
3132	WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.	4.3	4.1	I	-	
3132	WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.	4.3	4.1	II	-	
3132	WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.	4.3	5.1	III	-	
3133	WATER-REACTIVE SOLID, OXIDIZING, N.O.S.	4.3	5.1	II	-	
3133	WATER-REACTIVE SOLID, OXIDIZING, N.O.S.	4.3	5.1	III	-	
3134	WATER-REACTIVE SOLID, TOXIC, N.O.S.	4.3	6.1	I	Category D	
3134	WATER-REACTIVE SOLID, TOXIC, N.O.S.	4.3	6.1	II	Category E SW5	

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3134	WATER-REACTIVE SOLID, TOXIC, N.O.S.	4.3	6.1	III	Category E SW5	
3135	WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.	4.3	4.2	I	-	
3135	WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.	4.3	4.2	II	-	
3135	WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.	4.3	4.2	III	-	
3136	TRIFLUOROMETHANE, REFRIGERATED LIQUID	2.2			Category D	
3137	OXIDIZING SOLID, FLAMMABLE, N.O.S.	5.1	4.1	I	-	
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	2.1			Category D SW2	SG46
3139	OXIDIZING LIQUID, N.O.S.	5.1		I	Category D	SG38 SG49 SG60
3139	OXIDIZING LIQUID, N.O.S.	5.1		II	Category B	SG38 SG49 SG60
3139	OXIDIZING LIQUID, N.O.S.	5.1		III	Category B	SG38 SG49 SG60
3140	ALKALOIDS, LIQUID, N.O.S. or ALKALOIDS SALTS, LIQUID, N.O.S.	6.1		I	Category A	
3140	ALKALOIDS, LIQUID, N.O.S. or ALKALOIDS SALTS, LIQUID, N.O.S.	6.1		II	Category A	
3140	ALKALOIDS, LIQUID, N.O.S. or ALKALOIDS SALTS, LIQUID, N.O.S.	6.1		III	Category A	
3141	ANTIMONY COMPOUND, INORGANIC, LIQUID, N.O.S.	6.1		III	Category A	
3142	DISINFECTANT, LIQUID, TOXIC, N.O.S.	6.1		I	Category A SW2	
3142	DISINFECTANT, LIQUID, TOXIC, N.O.S.	6.1		II	Category A SW2	
3142	DISINFECTANT, LIQUID, TOXIC, N.O.S.	6.1		III	Category A SW2	
3143	DYE, SOLID, TOXIC, N.O.S. or DYE INTERMEDIATE, SOLID, TOXIC, N.O.S.	6.1		I	Category A	
3143	DYE, SOLID, TOXIC, N.O.S. or DYE INTERMEDIATE, SOLID, TOXIC, N.O.S.	6.1		II	Category A	
3143	DYE, SOLID, TOXIC, N.O.S. or DYE INTERMEDIATE, SOLID, TOXIC, N.O.S.	6.1		III	Category A	
3144	NICOTINE COMPOUND, LIQUID, N.O.S. or NICOTINE PREPARATION, LIQUID, N.O.S.	6.1		I	Category B SW2	
3144	NICOTINE COMPOUND, LIQUID, N.O.S. or NICOTINE PREPARATION, LIQUID, N.O.S.	6.1		II	Category B SW2	
3144	NICOTINE COMPOUND, LIQUID, N.O.S. or NICOTINE PREPARATION, LIQUID, N.O.S.	6.1		III	Category B SW2	
3145	ALKYLPHENOLS, LIQUID, N.O.S. (including C2-C12 homologues)	8		I	Category B	
3145	ALKYLPHENOLS, LIQUID, N.O.S. (including C2-C12 homologues)	8		II	Category B	
3145	ALKYLPHENOLS, LIQUID, N.O.S. (including C2-C12 homologues)	8		III	Category A	
3146	ORGANOTIN COMPOUND, SOLID, N.O.S.	6.1	P	I	Category B SW2	
3146	ORGANOTIN COMPOUND, SOLID, N.O.S.	6.1	P	II	Category A SW2	

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3146	ORGANOTIN COMPOUND, SOLID, N.O.S.	6.1	P	III	Category A SW2	
3147	DYE, SOLID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, SOLID, CORROSIVE, N.O.S.	8		I	Category A	
3147	DYE, SOLID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, SOLID, CORROSIVE, N.O.S.	8		II	Category A	
3147	DYE, SOLID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, SOLID, CORROSIVE, N.O.S.	8		III	Category A	
3148	WATER-REACTIVE LIQUID, N.O.S.	4.3		I	Category E SW2	
3148	WATER-REACTIVE LIQUID, N.O.S.	4.3		II	Category E SW2	
3148	WATER-REACTIVE LIQUID, N.O.S.	4.3		III	Category E SW2	
3149	HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURE, with acid(s), water and not more than 5	5.1	8	II	Category D SW1	SG16 SG59 SG72
3150	DEVICES, SMALL, HYDROCARBON GAS POWERED or HYDROCARBON GAS REFILLS FOR SMALL DEVICES wi	2.1			Category B SW2	
3151	POLYHALOGENATED BIPHENYLS, LIQUID or POLYHALOGENATED TERPHENYLS, LIQUID	9		II	Category A	SG50
3152	POLYHALOGENATED BIPHENYLS, SOLID or POLYHALOGENATED TERPHENYLS, SOLID	9	P	II	Category A	SG50
3153	PERFLUORO (METHYL VINYL ETHER)	2.1			Category E SW2	
3154	PERFLUORO (ETHYL VINYL ETHER)	2.1			Category E SW2	
3155	PENTACHLOROPHENOL	6.1	P	II	Category A	
3156	COMPRESSED GAS, OXIDIZING, N.O.S.	2.2	5.1		Category D	
3157	LIQUEFIED GAS, OXIDIZING, N.O.S.	2.2	5.1		Category D	
3158	GAS, REFRIGERATED LIQUID, N.O.S.	2.2			Category D	
3159	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)	2.2			Category A	
3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.	2.3	2.1		Category D SW2	
3161	LIQUEFIED GAS, FLAMMABLE, N.O.S.	2.1			Category D SW2	
3162	LIQUEFIED GAS, TOXIC, N.O.S.	2.3			Category D SW2	
3163	LIQUEFIED GAS, N.O.S.	2.2			Category A	
3164	ARTICLES, PRESSURIZED, PNEUMATIC or HYDRAULIC (containing non-flammable gas)	2.2			Category A	
3165	AIRCRAFT HYDRAULIC POWER UNIT FUEL TANK (containing a mixture of anhydrous hydrazine and	3	"6.1/8	I	Category D SW2	SG5 SG8 SG13
3166	ENGINE, INTERNAL COMBUSTION or VEHICLE, FLAMMABLE GAS POWERED or VEHICLE, FLAMMABLE LIQU	9			Category A	
3167	GAS SAMPLE, NON-PRESSURIZED, FLAMMABLE, N.O.S., not refrigerated liquid	2.1			Category D	
3168	GAS SAMPLE, NON-PRESSURIZED, TOXIC, FLAMMABLE, N.O.S., not refrigerated liquid	2.3	2.1		Category D	

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3169	GAS SAMPLE, NON-PRESSURIZED, TOXIC, N.O.S., not refrigerated liquid	2.3			Category D	
3170	ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS	4.3		II	Category B SW5 H1	
3170	ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS	4.3		III	Category B SW5 H1	
3171	BATTERY-POWERED VEHICLE or BATTERY-POWERED EQUIPMENT	9			Category A	
3172	TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S.	6.1		I	Category B	
3172	TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S.	6.1		II	Category B	
3172	TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S.	6.1		III	Category A	
3174	TITANIUM DISULPHIDE	4.2		III	Category A	
3175	SOLIDS CONTAINING FLAMMABLE LIQUID, N.O.S.	4.1		II	Category B	
3176	FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.	4.1		II	Category C	
3176	FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.	4.1		III	Category C	
3178	FLAMMABLE SOLID, INORGANIC, N.O.S.	4.1		II	Category B	
3178	FLAMMABLE SOLID, INORGANIC, N.O.S.	4.1		III	Category B	
3179	FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S.	4.1	6.1	II	Category B SW2	
3179	FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S.	4.1	6.1	III	Category B SW2	
3180	FLAMMABLE SOLID, CORROSIVE, INORGANIC, N.O.S.	4.1	8	II	Category D SW2	
3180	FLAMMABLE SOLID, CORROSIVE, INORGANIC, N.O.S.	4.1	8	III	Category D SW2	
3181	METAL SALTS OF ORGANIC COMPOUNDS, FLAMMABLE, N.O.S.	4.1		II	Category B SW2	
3181	METAL SALTS OF ORGANIC COMPOUNDS, FLAMMABLE, N.O.S.	4.1		III	Category B SW2	
3182	METAL HYDRIDES, FLAMMABLE, N.O.S.	4.1		II	Category E	
3182	METAL HYDRIDES, FLAMMABLE, N.O.S.	4.1		III	Category E	
3183	SELF-HEATING LIQUID, ORGANIC, N.O.S.	4.2		II	Category C	
3183	SELF-HEATING LIQUID, ORGANIC, N.O.S.	4.2		III	Category C	
3184	SELF-HEATING LIQUID, TOXIC, ORGANIC, N.O.S.	4.2	6.1	II	Category C	
3184	SELF-HEATING LIQUID, TOXIC, ORGANIC, N.O.S.	4.2	6.1	III	Category C	
3185	SELF-HEATING LIQUID, CORROSIVE, ORGANIC, N.O.S.	4.2	8	II	Category C	
3185	SELF-HEATING LIQUID, CORROSIVE, ORGANIC, N.O.S.	4.2	8	III	Category C	
3186	SELF-HEATING LIQUID, INORGANIC, N.O.S.	4.2		II	Category C	
3186	SELF-HEATING LIQUID, INORGANIC, N.O.S.	4.2		III	Category C	
3187	SELF-HEATING LIQUID, TOXIC, INORGANIC, N.O.S.	4.2	6.1	II	Category C	
3187	SELF-HEATING LIQUID, TOXIC, INORGANIC, N.O.S.	4.2	6.1	III	Category C	
3188	SELF-HEATING LIQUID, CORROSIVE, INORGANIC, N.O.S.	4.2	8	II	Category C	
3188	SELF-HEATING LIQUID, CORROSIVE, INORGANIC, N.O.S.	4.2	8	III	Category C	
3189	METAL POWDER, SELF-HEATING, N.O.S.	4.2		II	Category C	

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3189	METAL POWDER, SELF-HEATING, N.O.S.	4.2		III	Category C	
3190	SELF-HEATING SOLID, INORGANIC, N.O.S.	4.2		II	Category C	
3190	SELF-HEATING SOLID, INORGANIC, N.O.S.	4.2		III	Category C	
3191	SELF-HEATING SOLID, TOXIC, INORGANIC, N.O.S.	4.2	6.1	II	Category C	
3191	SELF-HEATING SOLID, TOXIC, INORGANIC, N.O.S.	4.2	6.1	III	Category C	
3192	SELF-HEATING SOLID, CORROSIVE, INORGANIC, N.O.S.	4.2	8	II	Category C	
3192	SELF-HEATING SOLID, CORROSIVE, INORGANIC, N.O.S.	4.2	8	III	Category C	
3194	PYROPHORIC LIQUID, INORGANIC, N.O.S.	4.2		I	Category D	SG63
3200	PYROPHORIC SOLID, INORGANIC, N.O.S.	4.2		I	Category D	
3205	ALKALINE EARTH METAL ALCOHOLATES, N.O.S.	4.2		II	Category B	
3205	ALKALINE EARTH METAL ALCOHOLATES, N.O.S.	4.2		III	Category B	
3206	ALKALI METAL ALCOHOLATES, SELF-HEATING, CORROSIVE, N.O.S.	4.2	8	II	Category B	
3206	ALKALI METAL ALCOHOLATES, SELF-HEATING, CORROSIVE, N.O.S.	4.2	8	III	Category B	
3208	METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.	4.3		I	Category E SW2	
3208	METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.	4.3		II	Category E SW2	
3208	METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.	4.3		III	Category E SW2	
3209	METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.	4.3	4.2	I	Category E SW2	
3209	METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.	4.3	4.2	II	Category E SW2	
3209	METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.	4.3	4.2	III	Category E SW2	
3210	CHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		II	Category B	SG38 SG49 SG62
3210	CHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		III	Category B	SG38 SG49 SG62
3211	PERCHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		II	Category B	SG38 SG49 SG62
3211	PERCHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		III	Category B	SG38 SG49 SG62
3212	HYPOCHLORITES, INORGANIC, N.O.S.	5.1		II	Category D SW1 SW17	SG35 SG38 SG49 SG53 SG60
3213	BROMATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		II	Category B	SG38 SG49 SG62
3213	BROMATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		III	Category B	SG38 SG49 SG62
3214	PERMANGANATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		II	Category D	SG38 SG49 SG60 SG62

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3215	PERSULPHATES, INORGANIC, N.O.S.	5.1		III	Category A	SG40 SG49
3216	PERSULPHATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		III	Category A	SG38 SG49 SG62
3218	NITRATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		II	Category B	SG38 SG49 SG62
3218	NITRATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		III	Category B	SG38 SG49 SG62
3219	NITRITES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		II	Category B	SG38 SG49 SG62
3219	NITRITES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		III	Category B	SG38 SG49 SG62
3220	PENTAFLUOROETHANE (REFRIGERANT GAS R 125)	2.2			Category A	
3221	SELF-REACTIVE LIQUID TYPE B	4.1	See SP181		Category D SW1	SG1 SG35 SG36
3222	SELF-REACTIVE SOLID TYPE B	4.1	See SP181		Category D SW1	SG1 SG35 SG36
3223	SELF-REACTIVE LIQUID TYPE C	4.1			Category D SW1	SG35 SG36
3224	SELF-REACTIVE SOLID TYPE C	4.1			Category D SW1	SG35 SG36
3225	SELF-REACTIVE LIQUID TYPE D	4.1			Category D SW1	SG35 SG36
3226	SELF-REACTIVE SOLID TYPE D	4.1			Category D SW1	SG35 SG36
3227	SELF-REACTIVE LIQUID TYPE E	4.1			Category D SW1	SG35 SG36
3228	SELF-REACTIVE SOLID TYPE E	4.1			Category D SW1	SG35 SG36
3229	SELF-REACTIVE LIQUID TYPE F	4.1			Category D SW1	SG35 SG36
3230	SELF-REACTIVE SOLID TYPE F	4.1			Category D SW1	SG35 SG36
3231	SELF-REACTIVE LIQUID TYPE B, TEMPERATURE CONTROLLED	4.1			Category D SW1 SW3	SG1 SG35 SG36
3232	SELF-REACTIVE SOLID TYPE B, TEMPERATURE CONTROLLED	4.1			Category D SW1 SW3	SG1 SG35 SG36
3233	SELF-REACTIVE LIQUID TYPE C, TEMPERATURE CONTROLLED	4.1			Category D SW1 SW3	SG35 SG36
3234	SELF-REACTIVE SOLID TYPE C, TEMPERATURE CONTROLLED	4.1			Category D SW1 SW3	SG35 SG36
3235	SELF-REACTIVE LIQUID TYPE D, TEMPERATURE CONTROLLED	4.1			Category D SW1 SW3	SG35 SG36
3236	SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED	4.1			Category D SW1 SW3	SG35 SG36
3237	SELF-REACTIVE LIQUID TYPE E, TEMPERATURE CONTROLLED	4.1			Category D SW1 SW3	SG35 SG36
3238	SELF-REACTIVE SOLID TYPE E, TEMPERATURE CONTROLLED	4.1			Category D SW1 SW3	SG35 SG36

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3239	SELF-REACTIVE LIQUID TYPE F, TEMPERATURE CONTROLLED	4.1			Category D SW1 SW3	SG35 SG36
3240	SELF-REACTIVE SOLID TYPE F, TEMPERATURE CONTROLLED	4.1			Category D SW1 SW3	SG35 SG36
3241	2-BROMO-2-NITROPROPANE-1,3-DIOL	4.1		III	Category C SW1 SW2 H2 H3	
3242	AZODICARBONAMIDE	4.1		II	Category D	SG17 SG35 SG36
3243	SOLIDS CONTAINING TOXIC LIQUID, N.O.S.	6.1		II	Category B SW2	
3244	SOLIDS CONTAINING CORROSIVE LIQUID, N.O.S.	8		II	Category B SW2	
3245	GENETICALLY MODIFIED MICROORGANISMS or GENETICALLY MODIFIED ORGANISMS	9			SW7	SG50
3246	METHANESULPHONYL CHLORIDE	6.1	8	I	Category D SW2	
3247	SODIUM PEROXOBORATE, ANHYDROUS	5.1		II	Category A SW1 H1	
3248	MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S	3	6.1	II	Category B SW2	
3248	MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S	3	6.1	III	Category A	
3249	MEDICINE, SOLID, TOXIC, N.O.S.	6.1		II	Category C SW2	
3249	MEDICINE, SOLID, TOXIC, N.O.S.	6.1		III	Category C SW2	
3250	CHLOROACETIC ACID, MOLTEN	6.1	8	II	Category C SW2	
3251	ISOSORBIDE-5-MONONITRATE	4.1		III	Category D SW1 H2 H3	
3252	DIFLUOROMETHANE (REFRIGERANT GAS R 32)	2.1			Category D SW2	
3253	DISODIUM TRIOXOSILICATE	8		III	Category A	SG35
3254	TRIBUTYLPHOSPHANE	4.2		I	Category D	SG44
3255	tert-BUTYL HYPOCHLORITE	4.2	8	I	Category D	
3256	ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flashpoint above 60ºC, at or above i	3		III	Category A	
3257	ELEVATED TEMPERATURE LIQUID, N.O.S. at or above 100ºC and below its flashpoint (includin	9		III	Category A SW5	
3258	ELEVATED TEMPERATURE SOLID, N.O.S. at or above 240ºC	9		III	Category A SW5	
3259	AMINES, SOLID, CORROSIVE, N.O.S. or POLYAMINES, SOLID, CORROSIVE, N.O.S.	8		I	Category A	SG35
3259	AMINES, SOLID, CORROSIVE, N.O.S. or POLYAMINES, SOLID, CORROSIVE, N.O.S.	8		II	Category A	SG35
3259	AMINES, SOLID, CORROSIVE, N.O.S. or POLYAMINES, SOLID, CORROSIVE, N.O.S.	8		III	Category A	SG35
3260	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.	8		I	Category B	
3260	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.	8		II	Category B	

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3260	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.	8		III	Category A	
3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.	8		I	Category B	
3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.	8		II	Category B	
3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.	8		III	Category A	
3262	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S.	8		I	Category B	SG35
3262	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S.	8		II	Category B	SG35
3262	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S.	8		III	Category A	SG35
3263	CORROSIVE SOLID, BASIC,ORGANIC, N.O.S.	8		I	Category B	SG35
3263	CORROSIVE SOLID, BASIC,ORGANIC, N.O.S.	8		II	Category B	SG35
3263	CORROSIVE SOLID, BASIC,ORGANIC, N.O.S.	8		III	Category A	SG35
3264	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8		I	Category B SW2	
3264	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8		II	Category B SW2	
3264	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8		III	Category A SW2	
3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.	8		I	Category B SW2	
3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.	8		II	Category B SW2	
3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.	8		III	Category A SW2	
3266	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	8		I	Category B SW2	SG35
3266	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	8		II	Category B SW2	SG35
3266	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	8		III	Category A SW2	SG35
3267	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	8		I	Category B SW2	SG35
3267	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	8		II	Category B SW2	SG35
3267	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	8		III	Category A SW2	SG35
3268	AIR BAG INFLATORS or AIR BAG MODULES or SEAT-BELT PRETENSIONERS	9		III	Category A	
3269	POLYESTER RESIN KIT	3		II	Category B	
3269	POLYESTER RESIN KIT	3		III	Category A	
3270	NITROCELLULOSE MEMBRANE FILTERS with not more than 12.6% nitrogen, by dry mass	4.1		II	Category D	
3271	ETHERS, N.O.S.	3		II	Category B	
3271	ETHERS, N.O.S.	3		III	Category A	
3272	ESTERS, N.O.S.	3		II	Category B	
3272	ESTERS, N.O.S.	3		III	Category A	
3273	NITRILES, FLAMMABLE, TOXIC, N.O.S.	3	6.1	I	Category E SW2	SG35
3273	NITRILES, FLAMMABLE, TOXIC, N.O.S.	3	6.1	II	Category B SW2	SG35
3274	ALCOHOLATES SOLUTION, N.O.S. in alcohol	3	8	II	Category B	

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3275	NITRILES, TOXIC, FLAMMABLE, N.O.S.	6.1	3	I	Category B SW2	SG35
3275	NITRILES, TOXIC, FLAMMABLE, N.O.S.	6.1	3	II	Category B SW2	SG35
3276	NITRILES, TOXIC, LIQUID, N.O.S.	6.1		I	Category B	SG35
3276	NITRILES, TOXIC, LIQUID, N.O.S.	6.1		II	Category B	SG35
3276	NITRILES, TOXIC, LIQUID, N.O.S.	6.1		III	Category A	SG35
3277	CHLOROFORMATES, TOXIC, CORROSIVE, N.O.S.	6.1	8	II	Category A SW1 SW2 H1 H2	
3278	ORGANOPHOSPHORUS COMPOUND, TOXIC, LIQUID, N.O.S.	6.1		I	Category B	
3278	ORGANOPHOSPHORUS COMPOUND, TOXIC, LIQUID, N.O.S.	6.1		II	Category B	
3278	ORGANOPHOSPHORUS COMPOUND, TOXIC, LIQUID, N.O.S.	6.1		III	Category A	
3279	ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE N.O.S.	6.1	3	I	Category B SW2	
3279	ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE N.O.S.	6.1	3	II	Category B SW2	
3280	ORGANOARSENIC COMPOUND, LIQUID, N.O.S.	6.1		I	Category B	
3280	ORGANOARSENIC COMPOUND, LIQUID, N.O.S.	6.1		II	Category B	
3280	ORGANOARSENIC COMPOUND, LIQUID, N.O.S.	6.1		III	Category A	
3281	METAL CARBONYLS, LIQUID, N.O.S.	6.1		I	Category D SW2	
3281	METAL CARBONYLS, LIQUID, N.O.S.	6.1		II	Category B SW2	
3281	METAL CARBONYLS, LIQUID, N.O.S.	6.1		III	Category B SW2	
3282	ORGANOMETALLIC COMPOUND, TOXIC, LIQUID, N.O.S.	6.1		I	Category B	
3282	ORGANOMETALLIC COMPOUND, TOXIC, LIQUID, N.O.S.	6.1		II	Category B	
3282	ORGANOMETALLIC COMPOUND, TOXIC, LIQUID, N.O.S.	6.1		III	Category A	
3283	SELENIUM COMPOUND, SOLID, N.O.S.	6.1		I	Category B	
3283	SELENIUM COMPOUND, SOLID, N.O.S.	6.1		II	Category B	
3283	SELENIUM COMPOUND, SOLID, N.O.S.	6.1		III	Category A	
3284	TELLURIUM COMPOUND, N.O.S.	6.1		I	Category B	
3284	TELLURIUM COMPOUND, N.O.S.	6.1		II	Category B	
3284	TELLURIUM COMPOUND, N.O.S.	6.1		III	Category A	
3285	VANADIUM COMPOUND, N.O.S.	6.1		I	Category B	
3285	VANADIUM COMPOUND, N.O.S.	6.1		II	Category B	
3285	VANADIUM COMPOUND, N.O.S.	6.1		III	Category A	
3286	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3	6.1/8	I	Category E SW2	SG5 SG8
3286	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3	6.1/8	II	Category B SW2	SG5 SG8
3287	TOXIC LIQUID, INORGANIC, N.O.S.	6.1		I	Category B SW2	

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3287	TOXIC LIQUID, INORGANIC, N.O.S.	6.1		II	Category B SW2	
3287	TOXIC LIQUID, INORGANIC, N.O.S.	6.1		III	Category A SW2	
3288	TOXIC SOLID, INORGANIC, N.O.S.	6.1		I	Category B	
3288	TOXIC SOLID, INORGANIC, N.O.S.	6.1		II	Category B	
3288	TOXIC SOLID, INORGANIC, N.O.S.	6.1		III	Category A	
3289	TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.	6.1	8	I	Category B SW2	
3289	TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.	6.1	8	II	Category B SW2	
3290	TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.	6.1	8	I	Category B SW2	
3290	TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.	6.1	8	II	Category B SW2	
3291	CLINICAL WASTE, UNSPECIFIED, N.O.S. or (BIO) MEDICAL WASTE, N.O.S. or REGULATED MEDICAL	6.2		II	SW28	
3292	BATTERIES, CONTAINING SODIUM or CELLS, CONTAINING SODIUM	4.3		II	Category A	
3293	HYDRAZINE, AQUEOUS SOLUTION with not more than 37% hydrazine, by mass	6.1		III	Category A	SG35
3294	HYDROGEN CYANIDE, SOLUTION IN ALCOHOL with not more than 45% hydrogen cyanide	6.1	3P	I	Category D SW2	
3295	HYDROCARBONS, LIQUID, N.O.S.	3		I	Category E	
3295	HYDROCARBONS, LIQUID, N.O.S.	3		II	Category B	
3295	HYDROCARBONS, LIQUID, N.O.S.	3		III	Category A	
3296	HEPTAFLUOROPROPANE (REFRIGERANT GAS R 227)	2.2			Category A	
3297	ETHYLENE OXIDE AND CHLOROTETRAFLUOROETHANE MIXTURE with not more than 8.8% ethylene oxide	2.2			Category A	
3298	ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE with not more than 7.9% ethylene oxide	2.2			Category A	
3299	ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE with not more than 5.6% ethylene oxide	2.2			Category A	
3300	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 87% ethylene oxide	2.3	2.1		Category D SW2	
3301	CORROSIVE LIQUID, SELF-HEATING, N.O.S.	8	4.2	I	Category D	
3301	CORROSIVE LIQUID, SELF-HEATING, N.O.S.	8	4.2	II	Category D	
3302	2-DIMETHYLAMINOETHYL ACRYLATE	6.1		II	Category D SW1	
3303	COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S.	2.3	5.1		Category D SW2	
3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.	2.3	8		Category D SW2	
3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	2.3	2.1/8		Category D SW2	SG4 SG9
3306	COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	2.3	5.1/8		Category D SW2	SG6 SG19
3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.	2.3	5.1		Category D SW2	

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3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.	2.3	8		Category D SW2	
3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	2.3	2.1/8		Category D SW2	SG4 SG9
3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	2.3	5.1/8		Category D SW2	SG6 SG19
3311	GAS, REFRIGERATED LIQUID, OXIDIZING, N.O.S.	2.2	5.1		Category D	
3312	GAS, REFRIGERATED LIQUID, FLAMMABLE, N.O.S.	2.1			Category D SW2	
3313	ORGANIC PIGMENTS, SELF-HEATING	4.2		II	Category C	
3313	ORGANIC PIGMENTS, SELF-HEATING	4.2		III	Category C	
3314	PLASTICS MOULDING COMPOUND in dough, sheet or extruded rope form, evolving flammable vapour	9		III	Category E SW1 SW6	SG5 SG14
3315	CHEMICAL SAMPLE, TOXIC	6.1		I	Category D SW2	
3316	CHEMICAL KIT or FIRST AID KIT	9			Category A	
3317	2-AMINO-4,6-DINITROPHENOL, WETTED with not less than 20% water, by mass	4.1		I	Category D	SG7 SG30
3318	AMMONIA SOLUTION relative density less than 0.880 at 15°C in water, with more than 50% ammonia	2.3	8		Category D SW2	SG35 SG46
3319	NITROGLYCERIN MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 2% but not more than 10% nitroglycerin, by mass	4.1			Category E	
3320	SODIUM BOROHYDRIDE AND SODIUM HYDROXIDE SOLUTION with not more than 12% sodium borohydride and not more than 40% sodium hydroxide, by mass	8		II	Category A	SG35
3320	SODIUM BOROHYDRIDE AND SODIUM HYDROXIDE SOLUTION with not more than 12% sodium borohydride and not more than 40% sodium hydroxide, by mass	8		III	Category A	SG35
3321	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), non fissile or fissile-excepted	7	See SP172		Category A SW20	
3322	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III), non fissile or fissile-excepted	7	See SP172		Category A SW20	
3323	RADIOACTIVE MATERIAL, TYPE C PACKAGE, non fissile or fissile-excepted	7	See SP172		Category A SW12	
3324	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), FISSILE	7	See SP172		Category A SW12 SW20	
3325	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY, (LSA-III), FISSILE	7	See SP172		Category A SW12	
3326	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), FISSILE	7	See SP172		Category A SW12	
3327	RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE, non-special form	7	See SP172		Category A SW12 SW20 SW21	
3328	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE	7	See SP172		Category A SW12	
3329	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE	7	See SP172		Category A SW12	
3330	RADIOACTIVE MATERIAL, TYPE C PACKAGE, FISSILE	7	See SP172		Category A SW12	
3331	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, FISSILE	7	See SP172		Category A SW13	

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3332	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, non fissile or fissile-excepted	7	See SP172		Category A	
3333	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE	7	See SP172		Category A SW12	
3334	AVIATION REGULATED LIQUID, N.O.S.	9			-	
3335	AVIATION REGULATED SOLID, N.O.S.	9			-	
3336	MERCAPTANS, LIQUID, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.	3		I	Category E	SG50 SG57
3336	MERCAPTANS, LIQUID, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.	3		II	Category B	SG50 SG57
3336	MERCAPTANS, LIQUID, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.	3		III	Category B	SG50 SG57
3337	REFRIGERANT GAS R 404A	2.2			Category A	
3338	REFRIGERANT GAS R 407A	2.2			Category A	
3339	REFRIGERANT GAS R 407B	2.2			Category A	
3340	REFRIGERANT GAS R 407C	2.2			Category A	
3341	THIOUREA DIOXIDE	4.2		II	Category D	
3341	THIOUREA DIOXIDE	4.2		III	Category D	
3342	XANTHATES	4.2		II	Category D SW2	
3342	XANTHATES	4.2		III	Category D SW2	
3343	NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, FLAMMABLE, N.O.S. with not more than 30% nitroglycerin, by mass	3			Category D	
3344	PENTAERYTHRITE TETRANITRATE (PENTAERYTHRITOL TETRANITRATE; PETN) MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 10% but not more than 20% PETN, by mass	4.1		II	Category E	
3345	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1		I	Category A SW2	
3345	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1		II	Category A SW2	
3345	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1		III	Category A SW2	
3346	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23°C	3	6.1	I	Category B SW2	
3346	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23°C	3	6.1	II	Category B SW2	
3347	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not than 23°C	6.1	3	I	Category B SW2	
3347	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23°C	6.1	3	II	Category B SW2	
3347	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23°C	6.1	3	III	Category A SW2	

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3348	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1		I	Category B SW2	
3348	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1		II	Category B SW2	
3348	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1		III	Category A SW2	
3349	PYRETHROID PESTICIDE, SOLID, TOXIC	6.1		I	Category A SW2	
3349	PYRETHROID PESTICIDE, SOLID, TOXIC	6.1		II	Category A SW2	
3349	PYRETHROID PESTICIDE, SOLID, TOXIC	6.1		III	Category A SW2	
3350	PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23°C	3	6.1	I	Category B SW2	
3350	PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23°C	3	6.1	II	Category B SW2	
3351	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23°C	6.1	3	I	Category B SW2	
3351	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23°C	6.1	3	II	Category B SW2	
3351	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23°C	6.1	3	III	Category A SW2	
3352	PYRETHROID PESTICIDE, LIQUID, TOXIC	6.1		I	Category B SW2	
3352	PYRETHROID PESTICIDE, LIQUID, TOXIC	6.1		II	Category B SW2	
3352	PYRETHROID PESTICIDE, LIQUID, TOXIC	6.1		III	Category A SW2	
3354	INSECTICIDE GAS, FLAMMABLE, N.O.S.	2.1			Category D	
3355	INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.	2.3	2.1		Category D SW2	
3356	OXYGEN GENERATOR, CHEMICAL	5.1		II	Category D	
3357	NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, N.O.S with not more than 30% nitroglycerin,	3		II	Category D	
3358	REFRIGERATING MACHINES containing flammable, non-toxic, liquefied gas	2.1			Category D	
3359	FUMIGATED CARGO TRANSPORT UNIT	9			Category B SW2	
3360	FIBRES, VEGETABLE, DRY	4.1			Category A	
3361	CHLOROSILANES, TOXIC, CORROSIVE, N.O.S.	6.1	8	II	Category C SW2	
3362	CHLOROSILANES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.	6.1	"3/8	II	Category C SW2	SG5 SG8
3363	DANGEROUS GOODS IN MACHINERY or DANGEROUS GOODS IN APPARATUS	9			Category A	
3364	TRINITROPHENOL (PICRIC ACID), WETTED with not less than 10% water, by mass	4.1		I	Category E	SG7 SG30
3365	TRINITROCHLOROBENZENE (PICRYL CHLORIDE), WETTED with not less than 10% water by mass	4.1		I	Category E	SG7 SG30
3366	TRINITROTOLUENE (TNT), WETTED with not less than 10% water, by mass	4.1		I	Category E	SG7 SG30
3367	TRINITROBENZENE, WETTED with not less than 10% water, by mass	4.1		I	Category E	SG7 SG30

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3368	TRINITROBENZOIC ACID, WETTED with not less than 10% water, by mass	4.1		I	Category E	SG7 SG30
3369	SODIUM DINITRO-o-CRESOLATE, WETTED with not less than 10% water, by mass	4.1	6.1P	I	Category E	SG7 SG30
3370	UREA NITRATE, WETTED with not less than 10% water, by mass	4.1		I	Category E	SG7 SG30
3371	2-METHYLBUTANAL	3		II	Category B	
3373	BIOLOGICAL SUBSTANCE, CATEGORY B	6.2			Category C SW2 SW18	
3374	ACETYLENE, SOLVENT FREE	2.1			Category D SW1 SW2	SG46
3375	AMMONIUM NITRATE EMULSION or SUPENSION or GEL intermediate for blasting explosives	5.1		II	Category D SW1	SG16 SG42 SG45 SG47 SG48 SG51 SG56 SG58 SG59 SG61
3376	4-NITROPHENYLHYDRAZINE, with not less than 30% water, by mass	4.1		I	Category E	SG7 SG30
3377	SODIUM PERBORATE MONOHYDRATE	5.1		III	Category A SW1 SW23 H1	SG59
3378	SODIUM CARBONATE PEROXYHYDRATE	5.1		II	Category A SW1 H1	SG59
3378	SODIUM CARBONATE PEROXYHYDRATE	5.1		III	Category A SW1 SW23 H1	SG59
3379	DESENSITIZED EXPLOSIVE, LIQUID, N.O.S.	3		I	Category D	SG30
3380	DESENSITIZED EXPLOSIVE, SOLID, N.O.S.	4.1		I	Category D	SG7 SG30
3381	TOXIC BY INHALATION LIQUID, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m³ and saturated vapour concentration greater than or equal to 500 LC50	6.1		I	Category D SW2	
3382	TOXIC BY INHALATION LIQUID, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m³ and saturated vapour concentration greater than or equal to 10 LC50	6.1		I	Category D SW2	
3383	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m³ and saturated vapour concentration greater than or equal to 500 LC50	6.1	3	I	Category D SW2	
3384	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m³ and saturated vapour concentration greater than or equal to 10 LC50	6.1	3	I	Category D SW2	
3385	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m³ and saturated vapour concentration greater than or equal to 500 LC50	6.1	4.3	I	Category D SW2	

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3386	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m³ and saturated vapour concentration greater than or equal to 10 LC50	6.1	4.3	I	Category D SW2	
3387	TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m³ and saturated vapour concentration greater than or equal to 500 LC50	6.1	4.3	I	Category D SW2	
3388	TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an inhalation toxicity lower than or equal to 1000 ml/m³ and saturated vapour concentration greater than or equal to 10 LC50	6.1	5.1	I	Category D SW2	
3389	TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an inhalation toxicity lower than or equal to 200 ml/m³ and saturated vapour concentration greater than or equal to 500 LC50	6.1	8	I	Category D SW2	
3390	TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an inhalation toxicity lower than equal to 1000 ml/m³ and saturated vapour concentration greater than or equal to 10 LC50	6.1	8	I	Category D SW2	
3391	ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC	4.2		I	Category D	
3392	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC	4.2		I	Category D	SG63
3393	ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC, WATER-REACTIVE	4.2	4.3	I	Category D	SG35
3394	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE	4.2	4.3	I	Category D	SG35 SG63
3395	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE	4.3		I	Category E SW2	SG35
3395	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE	4.3		II	Category E SW2	SG35
3395	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE	4.3		III	Category E SW2	SG35
3396	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, FLAMMABLE	4.3	4.1	I	Category E SW2	SG35
3396	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, FLAMMABLE	4.3	4.1	II	Category E SW2	SG35
3396	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, FLAMMABLE	4.3	4.1	III	Category E SW2	SG35
3397	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, SELF-HEATING	4.3	4.2	I	Category E SW2	SG35
3397	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, SELF-HEATING	4.3	4.2	II	Category E SW2	SG35
3397	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, SELF-HEATING	4.3	4.2	III	Category E SW2	SG35
3398	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE	4.3		I	Category E SW2	SG35
3398	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE	4.3		II	Category E SW2	SG35
3398	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE	4.3		III	Category E SW2	SG35
3399	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE	4.3	3	I	Category D SW2	SG35

UN Number	PROPER SHIPPING NAME (Note: When there is more than one packing group or PSN the UN No. has been annotated with a, b, c)	Class or division	Subsidiary risk(s)	Packing Group	Stowage and Handling	Segregation
3399	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE	4.3	3	II	Category D SW2	SG35
3399	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE	4.3	3	III	Category E SW2	SG35
3400	ORGANOMETALLIC SUBSTANCE, SOLID , SELF-HEATING	4.2		II	Category C	
3400	ORGANOMETALLIC SUBSTANCE, SOLID , SELF-HEATING	4.2		III	Category C	
3401	ALKALI METAL AMALGAM, SOLID	4.3		I	Category D	SG35
3402	ALKALINE EARTH METAL AMALGAM, SOLID	4.3		I	Category D	SG35
3403	POTASSIUM METAL ALLOYS, SOLID	4.3		I	Category D	SG35
3404	POTASSIUM SODIUM ALLOYS, SOLID	4.3		I	Category D	SG35
3405	BARIUM CHLORATE SOLUTION	5.1	6.1	II	Category A	SG38 SG49 SG62
3405	BARIUM CHLORATE SOLUTION	5.1	6.1	III	Category A	SG38 SG49 SG62
3406	BARIUM PERCHLORATE SOLUTION	5.1	6.1	II	Category A	SG38 SG49 SG62
3406	BARIUM PERCHLORATE SOLUTION	5.1	6.1	III	Category A	SG38 SG49 SG62
3407	CHLORATE AND MAGNESIUM CHLORIDE MIXTURE SOLUTION	5.1		II	Category A	SG38 SG49 SG62
3407	CHLORATE AND MAGNESIUM CHLORIDE MIXTURE SOLUTION	5.1		III	Category A	SG38 SG49 SG62
3408	LEAD PERCHLORATE SOLUTION	5.1	6.1P	II	Category A	SG38 SG49
3408	LEAD PERCHLORATE SOLUTION	5.1	6.1P	III	Category A	SG38 SG49
3409	CHLORONITROBENZENES, LIQUID	6.1		II	Category A	
3410	4-CHLORO-o-TOLUIDINE HYDROCHLORIDE SOLUTION	6.1		III	Category A	
3411	beta-NAPHTHYLAMINE SOLUTION	6.1		II	Category A	
3411	beta-NAPHTHYLAMINE SOLUTION	6.1		III	Category A	
3412	FORMIC ACID with not less than 10% but not more than 85% acid by mass	8		II	Category A SW2	
3412	FORMIC ACID with not less than 5% but less than 10% acid by mass	8		III	Category A SW2	
3413	POTASSIUM CYANIDE SOLUTION	6.1	P	I	Category B	SG35
3413	POTASSIUM CYANIDE SOLUTION	6.1	P	II	Category B	SG35
3413	POTASSIUM CYANIDE SOLUTION	6.1	P	III	Category A	SG35
3414	SODIUM CYANIDE SOLUTION	6.1	P	I	Category B	SG35
3414	SODIUM CYANIDE SOLUTION	6.1	P	II	Category B	SG35
3414	SODIUM CYANIDE SOLUTION	6.1	P	III	Category A	SG35
3415	SODIUM FLUORIDE SOLUTION	6.1		III	Category A	SG35
3416	CHLOROACETOPHENONE, LIQUID	6.1		II	Category D SW1 SW2 H2	

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3417	XYLYL BROMIDE, SOLID	6.1		II	Category D SW2	
3418	2,4-TOLUYLENEDIAMINE SOLUTION	6.1		III	Category A	
3419	BORON TRIFLUORIDE ACETIC ACID COMPLEX, SOLID	8		II	Category A	
3420	BORON TRIFLUORIDE PROPIONIC ACID COMPLEX, SOLID	8		II	Category A	
3421	POTASSIUM HYDROGEN DIFLUORIDE SOLUTION	8	6.1	II	Category A SW1 SW2	SG35
3421	POTASSIUM HYDROGEN DIFLUORIDE SOLUTION	8	6.1	III	Category A SW1 SW2	SG35
3422	POTASSIUM FLUORIDE SOLUTION	6.1		III	Category A	SG35
3423	TETRAMETHYLAMMONIUM HYDROXIDE, SOLID	8		II	Category A	SG35
3424	AMMONIUM DINITRO-o-CRESOLATE SOLUTION	6.1	P	II	Category B	SG15 SG16 SG30 SG63
3424	AMMONIUM DINITRO-o-CRESOLATE SOLUTION	6.1	P	III	Category A	SG15 SG16 SG30 SG63
3425	BROMOACETIC ACID, SOLID	8		II	Category A	
3426	ACRYLAMIDE SOLUTION	6.1		III	Category A SW1 H2	
3427	CHLOROBENZYL CHLORIDES, SOLID	6.1		III	Category A	
3428	3-CHLORO-4-METHYLPHENYLISOCYANATE, SOLID	6.1		II	Category B SW2	
3429	CHLOROTOLUIDINES, LIQUID	6.1		III	Category A	
3430	XYLENOLS, LIQUID	6.1		II	Category A	
3431	NITROBENZOTRIFLUORIDES, SOLID	6.1		II	Category A SW2	
3432	POLYCHLORINATED BIPHENYLS, SOLID	9	P	II	Category A	SG50
3434	NITROCRESOLS, LIQUID	6.1		III	Category A	
3436	HEXAFLUOROACETONE HYDRATE, SOLID	6.1		II	Category B SW2	
3437	CHLOROCRESOLS, SOLID	6.1		II	Category A SW1 H2	
3438	alpha-METHYLBENZYL ALCOHOL, SOLID	6.1		III	Category A	
3439	NITRILES, TOXIC, SOLID, N.O.S.	6.1		I	Category B	SG35
3439	NITRILES, TOXIC, SOLID, N.O.S.	6.1		II	Category B	SG35
3439	NITRILES, TOXIC, SOLID, N.O.S.	6.1		III	Category A	SG35
3440	SELENIUM COMPOUND, LIQUID, N.O.S.	6.1		I	Category B	
3440	SELENIUM COMPOUND, LIQUID, N.O.S.	6.1		II	Category B	
3440	SELENIUM COMPOUND, LIQUID, N.O.S.	6.1		III	Category A	
3441	CHLORODINITROBENZENES, SOLID	6.1	P	II	Category A	SG15
3442	DICHLOROANILINES, SOLID	6.1	P	II	Category A SW2	
3443	DINITROBENZENES, SOLID	6.1		II	Category A	SG15
3444	NICOTINE HYDROCHLORIDE, SOLID	6.1		II	Category A	
3445	NICOTINE SULPHATE, SOLID	6.1		II	Category A	

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3446	NITROTOLUENES, SOLID	6.1		II	Category A	
3447	NITROXYLENES, SOLID	6.1		II	Category A	
3448	TEAR GAS SUBSTANCE, SOLID, N.O.S.	6.1		I	Category D SW2	
3448	TEAR GAS SUBSTANCE, SOLID, N.O.S.	6.1		II	Category D SW2	
3449	BROMOBENZYL CYANIDES, SOLID	6.1		I	Category D SW1 SW2 H2	SG35
3450	DIPHENYLCHLOROARSINE, SOLID	6.1	P	I	Category D SW2	
3451	TOLUIDINES, SOLID	6.1		II	Category A	
3452	XYLIDINES, SOLID	6.1		II	Category A	
3453	PHOSPHORIC ACID, SOLID	8		III	Category A	
3454	DINITROTOLUENES, SOLID	6.1		II	Category A	
3455	CRESOLS, SOLID	6.1	8	II	Category B	
3456	NITROSYLSULPHURIC ACID, SOLID	8		II	Category D SW2	SG6 SG16 SG17 SG19
3457	CHLORONITROTOLUENES, SOLID	6.1	P	III	Category A	SG6 SG8 SG10 SG12
3458	NITROANISOLES, SOLID	6.1		III	Category A	
3459	NITROBROMOBENZENES, SOLID	6.1		III	Category A	
3460	N-ETHYLBENZYLTOLUIDINES, SOLID	6.1		III	Category A	
3462	TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.	6.1		I	Category B	
3462	TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.	6.1		II	Category B	
3462	TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.	6.1		III	Category A	
3463	PROPIONIC ACID with not less than 90% acid by mass	8	3	II	Category A	
3464	ORGANOPHOSPHORUS COMPOUND, TOXIC, SOLID, N.O.S.	6.1		I	Category B	
3464	ORGANOPHOSPHORUS COMPOUND, TOXIC, SOLID, N.O.S.	6.1		II	Category B	
3464	ORGANOPHOSPHORUS COMPOUND, TOXIC, SOLID, N.O.S.	6.1		III	Category A	
3465	ORGANOARSENIC COMPOUND, SOLID, N.O.S.	6.1		I	Category B	
3465	ORGANOARSENIC COMPOUND, SOLID, N.O.S.	6.1		II	Category B	
3465	ORGANOARSENIC COMPOUND, SOLID, N.O.S.	6.1		III	Category A	
3466	METAL CARBONYLS, SOLID, N.O.S.	6.1		I	Category D SW2	
3466	METAL CARBONYLS, SOLID, N.O.S.	6.1		II	Category D SW2	
3466	METAL CARBONYLS, SOLID, N.O.S.	6.1		III	Category D SW2	
3467	ORGANOMETALLIC COMPOUND, TOXIC, SOLID, N.O.S.	6.1		I	Category B	
3467	ORGANOMETALLIC COMPOUND, TOXIC, SOLID, N.O.S.	6.1		II	Category B	

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3467	ORGANOMETALLIC COMPOUND, TOXIC, SOLID, N.O.S.	6.1		III	Category A	
3468	HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM or HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM	2.1			Category D	
3469	PAINT, FLAMMABLE, CORROSIVE (including paint, lacquer, enamel, stain, shellac, varnish,	3	8	I	Category E SW2	
3469	PAINT, FLAMMABLE, CORROSIVE (including paint, lacquer, enamel, stain, shellac, varnish,	3	8	II	Category B SW2	
3469	PAINT, FLAMMABLE, CORROSIVE (including paint, lacquer, enamel, stain, shellac, varnish,	3		III	Category A SW2	
3470	PAINT, CORROSIVE, FLAMMABLE (including paint, lacquer, enamel, stain, shellac, varnish,	8	3	II	Category B SW2	
3471	HYDROGENDIFLUORIDES SOLUTION, N.O.S.	8	6.1	II	Category A SW1 SW2	SG35
3471	HYDROGENDIFLUORIDES SOLUTION, N.O.S.	8	6.1	III	Category A SW1 SW2	SG35
3472	CROTONIC ACID, LIQUID	8		III	Category A SW1 H2	
3473	FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRID	3			Category A	
3474	1-HYDROXYBENZOTRIAZOLE MONOHYDRATE	4.1		I	Category D	SG7 SG30
3475	ETHANOL AND GASOLINE MIXTURE or ETHANOL AND MOTOR SPIRIT MIXTURE or ETHANOL AND PETROL MIXTURE, with more than 10% ethanolMIXTURE, with more than 10% ethanol	3		II	Category E	
3476	FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing water-reactive substances	4.3			Category A	
3477	FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRID	8			Category A	
3478	FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing liquefied flammable gas	2.1			Category B	
3479	FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT, containing hydrogen in metal hydride	2.1			Category B	
3480	LITHIUM ION BATTERIES (including lithium ion polymer batteries)	9		II	Category A	
3481	LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)	9		II	Category A	

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3482	ALKALI METAL DISPERSION, FLAMMABLE or ALKALINE EARTH METAL DISPERSION, FLAMMABLE	4.3	3	I	Category D	SG35
3483	MOTOR FUEL ANTI-KNOCK MIXTURE, FLAMMABLE	6.1	3	I	Category D SW1 SW2	
3484	HYDRAZINE, AQUEOUS SOLUTION, FLAMMABLE with more than 37% hydrazine, by mass	8	"3/6.1	I	Category D SW2	SG5 SG8 SG35
3485	CALCIUM HYPOCHLORITE, DRY, CORROSIVE or CALCIUM HYPOCHLORITE MIXTURE, DRY, CORROSIVE with more than 39% available chlorine (8.8% available oxygen)	5.1	8	II	Category D SW1 SW11	SG35 SG38 SG49 SG53 SG60
3486	CALCIUM HYPOCHLORITE MIXTURE, DRY, CORROSIVE with more than 10% but not more than 39% available chlorine	5.1	8	III	Category D SW1 SW11	SG35 SG38 SG49 SG53 SG60
3487	CALCIUM HYPOCHLORITE, HYDRATED, CORROSIVE or CALCIUM HYPOCHLORITE, HYDRATED MIXTURE, CORROSIVE, with not less than 5.5% but not more than 16% water	5.1	8	II	Category D SW1 SW11	SG35 SG38 SG49 SG53 SG60
3487	CALCIUM HYPOCHLORITE, HYDRATED, CORROSIVE or CALCIUM HYPOCHLORITE, HYDRATED MIXTURE, CORROSIVE, with not less than 5.5% but not more than 16% water	5.1	8	III	Category D SW1 SW11	SG35 SG38 SG49 SG53 SG60
3488	TOXIC BY INHALATION LIQUID, FLAMMABLE, CORROSIVE, N.O.S. with an LC50 lower than or equal to 200 ml/m3 and saturated vapour concentration greater than or equal to 500 LC50	6.1	"3/8	I	Category D SW2	SG5 SG8
3489	TOXIC BY INHALATION LIQUID, FLAMMABLE, CORROSIVE, N.O.S. with an LC50 lower than or equal to 1000 ml/m3 and saturated vapour concentration greater than or equal to 10 LC50	6.1	"3/8	I	Category D SW2	SG5 SG8
3490	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S. with an LC50 lower than or equal to 200 ml/m3 and saturated vapour concentration greater than or equal to 500 LC50	6.1	4.3/3	I	Category D SW2	SG5 SG7 SG13
3491	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S. with an LC50 lower than or equal to 1000 ml/m3 and saturated vapour concentration greater than or equal to 10 LC50	6.1	4.3/3	I	Category D SW2	SG5 SG7 SG13
3494	PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC	3		I	Category D SW2	
3494	PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC	3		II	Category D SW2	
3494	PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC	3		III	Category C SW2	
3495	IODINE	8	6.1	III	Category B SW2	SG37

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3496	BATTERIES, NICKEL-METAL HYDRIDE	9			Category A SW1	
3497	KRILL MEAL	4.2		II	Category B SW27	SG65
3497	KRILL MEAL	4.2		III	Category A	
3498	IODINE MONOCHLORIDE, LIQUID	8		II	Category D SW2	SG6 SG16 SG17 SG19
3499	CAPACITOR, electric double layer (with an energy storage capacity greater than 0.3 Wh)	9			Category A	
3500	CHEMICAL UNDER PRESSURE, N.O.S.	2.2			Category B	
3501	CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S.	2.1			Category D SW2	
3502	CHEMICAL UNDER PRESSURE, TOXIC, N.O.S.	2.2	6.1		Category D SW2	
3503	CHEMICAL UNDER PRESSURE, CORROSIVE, N.O.S.	2.2	8		Category D SW2	
3504	CHEMICAL UNDER PRESSURE, FLAMMABLE, TOXIC, N.O.S.	2.1	6.1		Category D SW2	
3505	CHEMICAL UNDER PRESSURE, FLAMMABLE, CORROSIVE, N.O.S.	2.1	8		Category D SW2	
3506	MERCURY CONTAINED IN MANUFACTURED ARTICLES	8	6.1	III	Category B SW2	SG24

In the dangerous goods list, amend the following entries as follows:

0005	in column (1) and in column (18), the first existing row in the dangerous goods list "0005" is replaced with "0004".
0082	in column (9), delete "PP65".
0241	in column (9), delete "PP65".
0331	in column (9), delete "PP65".
0332	in column (9), delete "PP65".
0222	Amend column (2) to read "AMMONIUM NITRATE". In column (6) insert "370". In column (10) insert "IBC100"; In column (11), insert "B2, B3, B17".
0503	In column (2), amend name to read: "SAFETY DEVICES, PYROTECHNIC".
1005	in column (4) insert "P"
1008	In column (6), replace "-" with "373"
1043	in column (7b) amend the code to read "E0".
1044	in column (9), insert "PP91".
1051 PG I	in column (7b) amend the code to read "E0".
1082	in column (2), add "(REFRIGERANT GAS R 1113)" at the end.
1089 PG I	in column (7b) amend the code to read "E0".
1098	in column (4) insert "P"
1183 PG I	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
1206	in column (4) insert "P".
1210	in column (6), insert "367".
1228 PG II	in column (7b) amend the code to read "E0".
1242 PG I	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
1259 PG I	in column (7b) amend the code to read "E0".
1261 PG II	in column (7b) amend the code to read "E0".
1262	in column (4) insert "P"
1263	in column (6), insert "367".
1272	in column (4) insert "P"
1278 PG II	in column (7b) amend the code to read "E0".
1295 PG I	in column (16)a insert "H1" and in column (16b) "SG25" and "SG26"
1299	in column (4) insert "P"

1308 PG I	in column (7b) amend the code to read "E0".
1309 PG II	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
1309 PG III	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
1323	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
1331 PG III	in column (7b) amend the code to read "E0".
1333 PG II	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
1334	in column (4) insert "P"
1339 PG II	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
1340 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
1343 PG II	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
1357	in column (6) delete "919"
1358 PG II	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
1360 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1361 PG II and PG III	in column (7b) amend the code to read "E0".
1363 PG III	in column (7b) amend the code to read "E0".
1364 PG III	in column (7b) amend the code to read "E0".
1365 PG III	in column (7b) amend the code to read "E0".
1373 PG III	in column (7b) amend the code to read "E0".
1376 PG III	in column (7b) amend the code to read "E0"; in column (16a) insert "H1" and in column (16b) "SG26"
1378 PG II	in colum (7b) amend the code to read "E0".
1379 PG III	in column (7b) amend the code to read "E0".
1380 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1383 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1386 PG III	in column (7b) amend the code to read "E0".
1389 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1390 PG II	in column (16a) insert "H1" and in column (16b) "SG26"

1391 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1392 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1393 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
1394 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
1395 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
1396 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
1396 PG III	in column (16a) insert "H1" and in column (16b) "SG26"
1397 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1398 PG III	in column (16a) insert "H1" and in column (16b) "SG26"
1400 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
1401 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
1402 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1402 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
1403 PG III	in column (16a) insert "H1" and in column (16b) "SG26"
1404 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1405 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
1405 PG III	in column (16a) insert "H1" and in column (16b) "SG26"
1407 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1408 PG III	in column (16a) insert "H1" and in column (16b) "SG26"
1409 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1409 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
1410 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1411 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1413 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1414 PG I	in column (16a) insert "H1" and in column (16b) "SG26"

1415 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1417 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
1418 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1418 PG II and PG III	in column (16a) insert "H1" and in column (16b) "SG26"
1419 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1420 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1421 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1422 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1423 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1426 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1427 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1428 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1432 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1433 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1435 PG III	in column (16a) insert "H1" and in column (16b) "SG26"
1436 PG I, II and PG III	in column (16a) insert "H1" and in column (16b) "SG26"
1449 PG II	in column (16a) replace "Category "A" with "Category C"; in column (16a) insert "H1" and in column (16b) "SG26" .
1457 PG II	in column (16a) replace "Category "A" with "Category C" and insert "H1"; in column (16)b "SG26"
1472 PG II	in column (16a) replace "Category "A" with "Category C" and insert "H1"; in column (16b) "SG26"
1476 PG II	in column (16a) replace "Category "A" with "Category C" and insert "H1"; in column (16b) "SG26"
1483 PG II and III	in column (16a) replace "Category "A" with "Category C" and insert "H1"; in column (16b) "SG26"
1491 PG I	in column (16a) replace "Category "B" with "Category C" and insert "H1"; in column (16b) "SG26"

1504 PG I	in column (16a) replace "Category B" with "Category C" and insert "H1"; in column (16b) "SG26"
1509 PG II	in column (16a) replace "Category "A" with "Category C" and insert "H1"; in column (16b) "SG26"
1516 PG II	in column (16a) replace "Category "A" with "Category C" and insert "H1"; in column (16b) "SG26"
1545 PG II	in column (7b) amend the code to read "E0".
1547	in column (4) insert "P"
1560 PG I	in column (7b) amend the code to read "E0".
1567 PG II	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
1569 PG II	in column (7b) amend the code to read "E0".
1583 all packing groups	in column (7b) amend the code to read "E0".
1600	in column (4) insert "P"
1603 PG II	in column (7b) amend the code to read "E0".
1613 PG I	in column (7b) amend the code to read "E0".
1614 PG I	in colum (7b) amend the code to read "E0".
1649 PG I	in column (7b) amend the code to read "E0".
1672 PG I	in column (7b) amend the code to read "E0".
1693 PG I and PG II	in column (7b) amend the code to read "E0".
1694 PG I	in column (7b) amend the code to read "E0".
1697 PG II	in column (7b) amend the code to read "E0".
1698 PG I	in column (7b) amend the code to read "E0".
1699 PG I	in column (7b) amend the code to read "E0".
1700	in column (5), delete the packing group.
1701 PG II	in colum (7b) amend the code to read "E0".
1708	in column (4) insert "P"
1714 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1722 PG I	in column (7b) amend the code to read "E0".
1732 PG II	in column (7b) amend the code to read "E0".
1748	in column (4) insert "P"

1792 PG II	in column (7b) amend the code to read "E0".
1796 PG II	in colum (7b) amend the code to read "E0".
1802 PG II	in column (7b) amend the code to read "E0".
1806 PG II	in column (7b) amend the code to read "E0".
1808 PG II	in column (7b) amend the code to read "E0".
1826 PG II	in column (7b) amend the code to read "E0".
1832 PG II	in column (7b) amend the code to read "E0".
1837 PG II	in column (7b) amend the code to read "E0".
1840	in column (4) insert "P"
1854 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1855 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1868 PG II	in column (7b) amend the code to read "E0".
1869 PG III	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
1870 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1889 PG I	in column (7b) amend the code to read "E0".
1906 PG II	in column (7b) amend the code to read "E0".
1920	in column (4) insert "P"
1928 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
1932 PG III	in column (7b) amend the code to read "E0"; in column (16a) insert "H1" and in column (16b) "SG26"
1939 PG II	in colum (7b) amend the code to read "E0".
1942	Amend column (2) to read "AMMONIUM NITRATE with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance".
2002 PG III	in column (7b) amend the code to read "E0".
2004 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
2006 PG III	in column (7b) amend the code to read "E0".
2008 PG II and III	in column (16a) insert "H1" and in column (16b) "SG26"
2009 PG III	in column (16a) insert "H1" and in column (16b) "SG26"

2010 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
2011 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
2012 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
2013 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
2016	in column (5), delete the packing group.
2017	in column (5), delete the packing group.
2030 PG II	in column (7b) amend the code to read "E0".
2038	in column (4) insert "P"
2073	in column (7b) amend the code to read "E0". in column (4) insert "P"
2208	in column (4) insert "P"
2210 PG III	in column (16a) insert "H1" and in column (16b) "SG26"
2212 PG II	in column (2) amend the name to read "ASBESTOS, AMPHIBOLE (amosite, tremolite, actinolite, anthophyllite, crocidolite)"; in column (6) insert "274"; in colum (7b) amend the code to read "E0"; in column (16a) insert "H4"; in column (17) delete the fifth sentence "Crocidolite (blue asbestos) should be regarded as the most hazardous type of asbestos." and the last two sentences "If cleaning of cargo spaces must be carried out at sea, the safety procedures followed and standard of equipment used must be at least as effective as those which would be employed in a port. Until such cleaning is undertaken, the cargo spaces in which the asbestos has been carried should be closed and access to those spaces should be prohibited."
2217 PG III	in column (7b) amend the code to read "E0".
2218	in column (4) insert "P"
2241	in column (4) insert "P"
2249 PG I	in column (7b) amend the code to read "E0".
2254 PG III	in column (7b) amend the code to read "E0".
2257 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
2295 PG I	in column (7b) amend the code to read "E0".
2304	in column (4) insert "P"
2325	in column (4) insert "P"
2331	in column (4) insert "P"

2363 PG I	in colum (7b) amend the code to read "E0".
2368	in column (4) insert "P"
2381 PG II	in column (4) insert "P" in colum (7b) amend the code to read "E0".
2404 PG II	in colum (7b) amend the code to read "E0".
2438 PG I	in column (7b) amend the code to read "E0".
2441 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
2442 PG II	in column (7b) amend the code to read "E0".
2443 PG II	in column (7b) amend the code to read "E0".
2463 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
2466 PG I	in column (16a) replace "Category E" with "Category D" and insert "H1"; in column (16b) "SG26"
2545 PG I, PG II and III	in column (16a) insert "H1" and in column (16b) "SG26"
2546 PG I, PG II and III	in column (16a) insert "H1" and in column (16b) "SG26"
2547 PG I	in column (16a) replace "Category E" with "Category D" and insert "H1"; in column (16b) "SG26"
2558 PG I	in colum (7b) amend the code to read "E0".
2590	in column (2) amend the name to read "ASBESTOS, CHRYSOTILE"; In column (16a) insert "H4" in column (17) delete the last two sentences "If cleaning of cargo spaces must be carried out at sea, the safety procedures followed and standard of equipment used must be at least as effective as those which would be employed in a port. Until such cleaning is undertaken, the cargo spaces in which the asbestos has been carried should be closed and access to those spaces should be prohibited."
2624 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
2626 PG II	in column (7b) amend the code to read "E0".
2672	in column (4) insert "P"
2691 PG II	in column (7b) amend the code to read "E0".
2709	in column (4) insert "P".
2740 PG I	in column (7b) amend the code to read "E0".
2743 PG II	in column (7b) amend the code to read "E0".

2749 PG I	in column (7b) amend the code to read "E0".
2793 PG III	in column (16a) insert "H1" and in column (16b) "SG26"
2798 PG II	in column (7b) amend the code to read "E0".
2799 PG II	in column (7b) amend the code to read "E0".
2805 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
2813 PG I, II and PG III	in column (16a) insert "H1" and in column (16b) "SG26"
2826 PG II	in column (7b) amend the code to read "E0".
2830 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
2835 PG II	in column (7b) amend the code to read "E0". in column (16a) insert "H1" and in column (16b) "SG26"
2844 PG III	in column (16a) insert "H1" and in column (16b) "SG26"
2845 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
2846 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
2850	in column (4) insert "P"
2858 PG III	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
2870 PG I (both entries)	in column (16a) insert "H1" and in column (16b) "SG26"
2878 PG III	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
2880 all packing groups	in column (4) insert "P"
2881 PG II	in column (7b) amend the code to read "E0".
2881 PG I, II and PG III	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
2910	in column (6) delete "325" and insert "368"
2950 PG III	in column (16a) insert "H1" and in column (16b) "SG26"
2956 PG III	in column (7b) amend the code to read "E0".
2965 PG I	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
2968 PG III	in column (16a) insert "H1" and in column (16b) "SG26"

2977	in column (6) delete special provision "172".
2978	in column (6) delete special provision "172".
2988	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
3048 PG I	in column (7b) amend the code to read "E0".
3066	in column (6), insert "367".
3077	in column (6), insert "969".
3078 PG II	in column (16a) insert "H1" and in column (16b) "SG26"
3082	in column (6) insert"969".
3089 PG II	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
3089 PGIII	in column (10) replace "IBC 06" by "IBC 08"; in column (11) insert "B2 and B4" in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
3090	in column (5), delete the packing group; in column (6) delete "957" and insert "376" and "377"; in column (8) insert "P908, P909", "LP903" and "LP904"; in column (16a) insert "SW19".
3091	in column (5), delete the packing group, in column (6) delete "957" and insert "376" and "377", in column (8) insert "P908, P909", "LP903" and "LP904" in column (16a) insert "SW19".
3094 PG I and PG II	in column (16a) insert "H1" and in column (16b) "SG26"
3096 PG I and PG II	in column (16a) insert "H1" and in column (16b) "SG26"
3097 PG II and PG III	in column (7b) amend the code to read "E0".
3100 PG II	in column (7b) amend the code to read "E0".
3121 PG I and PG II	in column (16a) insert "H1" and in column (16b) "SG26"
3121 PG II	in column (7b) amend the code to read "E0".
3122 PG I	in column (7b) amend the code to read "E0".
3123 PG I and PG II	in column (16a) insert "H1" and in column (16b) "SG26"
3123 PG I	in column (7b) amend the code to read "E0".
3125 PG I and II	in column (16a) insert "H1" and in column (16b) "SG26"

3127 PG II and PG III	in column (7b) amend the code to read "E0".
3129 PG I, PG II and PG III	in column (16a) insert "H1" and in column (16b) "SG26"
3129 PG II	in column (7b) amend the code to read "E0".
3130 PG I, PG II and PG III	in column (16a) insert "H1" and in column (16b) "SG26"
3130 PG II	in column (7b) amend the code to read "E0".
3131 PG I, II and PG III	in column (16a) insert "H1" and in column (16b) SG26"
3132 PG I, II and PG III	in column (16a) insert "H1" and in column (16b) "SG26"
3133 PG II and PG III	in column (7b) amend the code to read "E0". in column (16a) insert "H1" and in column (16b) "SG26"
3134 PG I, II and PG III	in column (16a) insert "H1" and in column (16b) "SG26"
3135 PG I, II and PG III	in column (16a) insert "H1" and in column (16b) "SG26"
3137 PG I	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
3148 PG I, PG II and PG III	in column (16a) insert "H1" and in column (16b) "SG26"
3164	in column (6), insert "371".
3166	in column (6) insert "SP 970".
3170 PG II and PG III	in column (16a) insert "H1" and in column (16b) "SG26"
3189 PG II and III	in column (16a) insert "H1" and in column (16b) "SG26"
3194 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
3200 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
3208 PG I and III	in column (16a) insert "H1" and in column (16b) "SG26"

3208 PG II	in column (7b) amend the code to read "E0"; in column (16a) insert "H1" and in column (16b) "SG26"
3209 PG I, PG II and PG III	in column (16a) insert "H1" and in column (16b) "SG26"
3242 PG II	in column (7b) amend the code to read "E0".
3251 PG III	in column (7b) amend the code to read "E0".
3268	in column (2), amend the name to read: "SAFETY DEVICES, electrically initiated" and in column (5), delete the packing group.
3292	in column (5), delete the packing group; in column (16a) insert "H1" and in column (16b) "SG26"
3294 PG I	in column (7b) amend the code to read "E0".
3315 PG I	in column (7b) amend the code to read "E0".
3316	delete the existing entry (note: the replacement for this entry is shown in the table for new entries)
3318	in column (4) insert "P"
3336 PG I	in column (7b) amend the code to read "E0".
3356	in column (5), delete the packing group.
3375	In column (8), replace "P099" by "P505"; in column (10) replace "IBC99" by "IBC02" and in column (11), insert "B16".
3378 PG II	In column (6) delete "967". (Amendment applies to the printed version only)
3385 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
3386 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
3391 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
3392 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
3393 PG I	in column (14) Insert "TP41". in column (16a) insert "H1" and in column (16b) "SG26"
3394 PG I	in column (14) Insert "TP41"; in column (16a) insert "H1" and in column (16b) "SG26"
3395 all packing groups	in column (14) Insert "TP41"; in column (16a) insert "H1" and in column (16b) "SG26"
3396 all packing groups	in column (14) Insert "TP41"; in column (16a) insert "H1" and in column (16b) "SG26"

3397 all packing groups	in column (14) Insert "TP41"; in column (16a) insert "H1" and in column (16b) "SG26"
3398 all packing groups	in column (14) Insert "TP41"; in column (16a) insert "H1" and in column (16b) "SG26"
3399 all packing groups	in column (14) Insert "TP41"; in column (16a) insert "H1" and in column (16b) "SG26"
3401 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
3402 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
3403 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
3404 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
3416 PG II	in column (7b) amend the code to read "E0".
3422	In column (15) replace "S-B" with "S-A".
3448 PG I and PG II	in column (7b) amend the code to read "E0".
3450 PG I	in column (7b) amend the code to read "E0".
3451	in column (4) insert "P"
3454	in column (4) insert "P"
3469	in column (6), insert "367".
3470	in column (6), insert "367".
3476	in column (16a) insert "H1" and in column (16b) "SG26"
3480	in column (5), delete the packing group; in column (6) delete "957" and insert "376" and "377"; in column (8) insert "P908, P909", "LP903" and "LP904"; in column (16a) insert "SW19".
3481	in column (5), delete the packing group; in column (6) delete "957" and insert "376" and "377"; in column (8) insert "P908, P909", "LP903" and "LP904" in column (16) insert "SW19".
3482 PG I	in column (16a) insert "H1" and in column (16b) "SG26"
3483 PG I	in column (7b) amend the code to read "E0"
3485	in column (4) insert "P"
3486	in column (4) insert "P"

3487 all packing groups	in column (4) insert "P"
3490 PG I	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
3491 PG I	in column (16a) insert "H1" and in column (16b) "SG25" and "SG26"
3498 PG II	in column (7b) amend the code to read "E0"
3499	In column (2) amend the proper shipping name to read as follows: "CAPACITOR, ELECTRIC DOUBLE LAYER (with an energy storage capacity greater than 0.3Wh)"
3506	in column (5), delete the packing group.

3.2.1 Dangerous Goods List

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16a)	(16b)	(17)
3316		9	-	II	251 340	See SP 251	See SP 340	P901	-	-	-	-	-	-	F-A, S-P	Category A.		-
3316	CHEMICAL KIT or FIRST AID KIT	9		III	251 340	See SP 251	See SP 340	P901	-	-	-	-	-	-	F-A, S-P	Category A.		-
3507	URANIUM HEXAFLUORIDE, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE, less than 0.1 kg per package, non-fissile or fissile-excepted	8	7	I	317 369	0	E0	P805	-	-	-	-	-	-	F-I, S-S	Category A, SW12		See 1.5.1.
3508	CAPACITOR, ASYMMETRIC (with an energy storage capacity greater than 0.3Wh)	9	-	-	372	0	E0	P003	-	-	-	-	-	-	--	Category A		Articles intended to store energy containing positive and negative electrodes comprised of different materials and an electrolyte. Asymetric capacitors may be transported in a charged state.
3509	PACKAGING DISCARDED, EMPTY, UNCLEANED	9			968	0	E0	-	-	-	-	-	-	-	--	-		This entry shall not be used for sea transport. Discarded packaging shall meet the requirements of 4.1.1.11. Discarded packaging means packagings, large packagings or intermediate bulk containers (IBC), or parts thereof, which have contained dangerous goods, other than radioactive material, which are transported for disposal, recycling or recovery of their material, other than reconditioning, repair, routine maintenance, remanufacturing or reuse, and which have been emptied to the extent that only residues of dangerous goods adhering to the packaging parts are present.
3510	ADSORBED GAS, FLAMMABLE, N.O.S.	2.1	-	-	274	0	E0	P208	-	-	-	-	-	-	F-D, S-U	Category D. SW2		-
3511	ADSORBED GAS, N.O.S.	2.2		-	274		E0	P208	-	-	-	-	-	-	F-C, S-V	Category A.		-
3512	ADSORBED GAS, TOXIC, N.O.S.	2.3		-	274	0	E0	P208	-	-	-	-	-	-	F-C, S-U	Category D. SW2		-
3513	ADSORBED GAS, OXIDIZING, N.O.S.	2.2	5.1	-	274	0	E0	P208	-	-	-	-	-	-	F-C. S-W	Category D.		-
3514	ADSORBED GAS, TOXIC, FLAMMABLE, N.O.S.	2.3	2.1	-	274	0	E0	P208	-	-	-	-	-	-	F-D, S,-U	Category D. SW2		-
3515	ADSORBED GAS, TOXIC, OXIDIZING, N.O.S.	2.3	5.1	-	274	0	E0	P208	-	-	-	-	-	-	F-C, S-W	Category D. SW2		-
3516	ADSORBED GAS, TOXIC, CORROSIVE, N.O.S.	2.3	8	-	274	0	E0	P208	-	-	-	-	-	-	F-C, S-U	Category D. SW2		-
3517	ADSORBED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	2.3	2.1 8	-	274	0	E0	P208	-	-	-	-	-	-	F-D, S-U	Category D. SW2 .	SG4 SG9	-

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16a)	(16b)	(17)
3518	ADSORBED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	2.3	5.1 8	-	274	0	E0	P208	-	-	-	-	-	-	F-C, S-W	Category D. SW2	SG6 SG19	-
3519	BORON TRIFLUORIDE, ADSORBED	2.3	8	-		0	E0	P208	-	-	-	-	-	-	F-C, S-U	Category D. SW2		Non-flammable, toxic and corrosive gas. Forms dense white corrosive fumes in moist air. Reacts violently with water, evolving hydrogen fluoride, an irritating and corrosive gas apparent as white fumes. In the presence of moisture, highly corrosive to glass and most metals. Much heavier than air (2.35). Highly irritating to skin, eyes and mucous membranes.
3520	CHLORINE, ADSORBED	2.3	5.1 8	-		0	E0	P208	-	-	-	-	-	-	F-C, S-W	Category D. SW2	SG6 SG19	Non-flammable, toxic and corrosive yellow gas with a pungent odour. Corrosive to glass and to most metals. Much heavier than air (2.4). Highly irritating to skin, eyes and mucous membranes. Powerful oxidant which may cause fire.
3521	SILICON TETRAFLUORIDE, ADSORBED	2.3	8	-		0	E0	P208	-	-	-	-	-	-	F-C, S-U	Category D. SW2		Non-flammable, toxic and corrosive gas with a pungent odour. Corrosive to metals. In moist air, produces hydrogen fluoride. Much heavier than air (3.6). Highly irritating to skin, eyes and mucous membranes.
3522	ARSINE, ADSORBED	2.3	2.1	-		0	E0	P208	-	-	-	-	-	-	F-D, S-U	Category D. SW2.		Flammable, toxic, colourless gas with a garlic odour. Explosive limits: 3.9% to 77.8%. Much heavier than air (2.8).
3523	GERMANE, ADSORBED	2.3	2.1	-		0	E0	P208	-	-	-	-	-	-	F-D, S-U	Category D. SW2		Flammable, toxic, colourless gas with a pungent odour. Much heavier than air (2.6)
3524	PHOSPHORUS PENTAFLUORIDE, ADSORBED	2.3	8	-		0	E0	P208	-	-	-	-	-	-	F-C, S-U	Category D. SW2		Non-flammable, toxic and corrosive gas with an irritating odour. Reacts with water or moist air to produce toxic and corrosive fumes. Corrosive to glass and to most metals. Much heavier than air (4.3). Highly irritating to skin, eyes and mucous membranes.
3525	PHOSPHINE, ADSORBED	2.3	2.1	-		0	E0	P208	-	-	-	-	-	-	F-D, S-U	Category D. SW2		Flammable, toxic, colourless gas with a garlic odour. Ignites spontaneously in air. Heavier than air (1.2). Irritating to skin, eyes and mucous membranes.
3526	HYDROGEN SELENIDE, ADSORBED	2.3	2.1	-		0	E0	P208	-	-	-	-	-	-	F-D, S-U	Category D. SW2		Flammable, toxic, colourless gas with a disagreeable odour. Much heavier than air (2.8). Highly irritating to skin, eyes and mucous membranes.

Chapter 3.3 – Special provisions applicable to certain substances, materials or articles

Amend the following Special Provisions as indicated hereunder:

SP 66 Amend to read as follows:

"Cinnabar is not subject to the provisions of this Code".

SP 122 At the end, add: ", 4.1.4.2 packing instruction IBC520 and 4.2.5.2.6 portable tank instruction T23."

SP 135 Amend to read as follows:

"135 The dihydrated sodium salt of dichloroisocyanuric acid does not meet the criteria for inclusion in Class 5.1 and is not subject to the provisions of this Code unless meeting the criteria for inclusion in another Class or Division."

SP 172 Amend to read as follows:

"172 Where a radioactive material has (a) subsidiary risk(s):

.1 The substance shall be allocated to Packing Group I, II or III, if appropriate, by application of the packing group criteria provided in part 2 corresponding to the nature of the predominant subsidiary risk;

.2 Packages shall be labelled with subsidiary risk labels corresponding to each subsidiary risk exhibited by the material; corresponding placards shall be affixed to cargo transport units in accordance with the relevant provisions of 5.3.1;

.3 For the purposes of documentation and package marking, the proper shipping name shall be supplemented with the name of the constituents which most predominantly contribute to this (these) subsidiary risk(s) and which shall be enclosed in parenthesis;

.4 The dangerous goods transport document shall indicate the subsidiary class or division and, where assigned the packing group as required by 5.4.1.4.1.4 and 5.4.1.4.1.5.

For packing, see also 4.1.9.1.5."

SP 225 At the end, add:

"Fire extinguishers shall be manufactured, tested, approved and labelled according to the provisions applied in the country of manufacture. Fire extinguishers under this entry include:

.1 portable fire extinguishers for manual handling and operation;

.2 fire extinguishers for installation in aircraft;

.3 fire extinguishers mounted on wheels for manual handling;

.4 fire extinguishing equipment or machinery mounted on wheels or wheeled platforms or units transported similar to (small) trailers, and

.5 fire extinguishers composed of a non-rollable pressure drum and equipment, and handled e.g. by fork lift or crane when loaded or unloaded."

SP 235 Amend to read as follows:

"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 to enhance safety in vehicles, vessels or aircraft – e.g. air bag inflators, air bag modules, seat-belt pretensioners, and pyromechanical devices."

SP 251 Insert the following new third paragraph after "to any individual substance in the kit":

"Where the kit contains only dangerous goods to which no packing group is assigned, no packing group need be indicated on the dangerous goods transport document."

SP 280 Amend to read as follows:

"280 This entry applies to safety devices for vehicles, vessels or aircraft, e.g. air bag inflators, air bag modules, seat-belt pretensioners, and pyromechanical devices, which contain dangerous goods of Class 1 or of other classes, when transported as component parts and if these articles as presented for transport have been tested in accordance with Test Series 6(c) of Part 1 of the Manual of Tests and Criteria, with no explosion of the device, no fragmentation of device casing or pressure receptacle, and no projection hazard nor thermal effect which would significantly hinder fire-fighting or emergency response efforts in the immediate vicinity. This entry does not apply to life saving appliances described in special provision 296 (UN Nos. 2990 and 3072)."

SP 289 Amend to read as follows:

"289 Safety devices, electrically initiated and safety devices, pyrotechnic installed in vehicles, vessels or aircraft or in completed components such as steering columns, door panels, seats, etc. are not subject to the provisions of this Code."

SP 306 Amend to read as follows:

"306 This entry may only be used for substances that are too insensitive for acceptance into Class 1 when tested in accordance with Test Series 2 (see Manual of Tests and Criteria, Part I)."

SP 309 Amend the last sentence to read as follows:

"Substances shall satisfactorily pass Tests 8(a), (b) and (c) of Test Series 8 of the Manual of Tests and Criteria, Part I, Section 18 and be approved by the competent authority."

SP 310 At the end, include a new "Note" to read as follows:

"For damage or defective lithium batteries and cells see SP 376"

SP 361 At the end of subparagraph .5 insert "except those manufactured before 1 January 2014;"

SP 363 In subparagraph .3, replace "loaded in an orientation" with "oriented"

SP 919 is deleted.

SP 957 Is deleted.

SP 961 Replace existing 961 with the following:

"SP 961 Internal combustion engines, fuel cell engines, vehicles, and battery-powered equipment are not subject to the provisions of this Code if any of the following conditions are met:

.1 Internal combustion engines, fuel cell engines vehicles, and battery-powered equipment are stowed on the vehicle, special category and ro-ro spaces or on the weather deck of a roll-on/roll-off ship or a cargo space designated by the Administration (flag State) in accordance with SOLAS 74, chapter II-2, regulation 20 as specifically designed and approved for the carriage of vehicles and there are no signs of leakage from the battery, engine, fuel cell, compressed gas cylinder or accumulator, or fuel tank when applicable. When packed in a cargo transport unit the exception does not apply to container cargo spaces of a ro-ro ship. Vehicles powered solely by lithium batteries and hybrid electric vehicles powered by both an internal combustion engine and lithium metal or ion batteries, the battery is of a type proved to meet the requirements of the United Nations Manual of Tests and Criteria, part III, subsection 38.3, unless otherwise approved by the competent Authority;

.2 Internal combustion engines, vehicles powered by a flammable liquid fuel with a flashpoint of 38°C or above, there are no leaks in any portion of the fuel system, the fuel tank(s) contains 450 ℓ of fuel or less and installed batteries are protected from short-circuit.

.3 Internal combustion engines with a fuel tank attached and vehicles powered by a flammable liquid fuel with a flashpoint less than 38°C, the fuel tank(s) are empty and installed batteries are protected from short circuit. The internal combustion engines or vehicle are considered to be empty of flammable liquid fuel when the fuel tank has been drained and the vehicle cannot be operated due to a lack of fuel. Engine components such as fuel lines, fuel filters and injectors do not need to be cleaned, drained or purged to be considered empty. The fuel tank does not need to be cleaned or purged;

.4 Internal combustion engines with an attached fuel tank and vehicles powered by a flammable gas (liquefied or compressed), the fuel tank(s) are empty and the positive pressure in the tank does not exceed 2 bar, the fuel shut-off or isolation valve is closed and secured, and installed batteries are protected from short circuit;

.5 Vehicles or battery powered equipment solely powered by a wet or dry electric storage battery or a sodium battery, and the battery is protected from short circuit;

.6 Internal combustion engines powered by a flammable liquid or flammable gas have been cleaned, drained and purged of all flammable liquids and gases or the engine has been sealed to prevent leakage of any residues; or

.7 Fuel cell engines are protected from inadvertent operation by closing fuel supply lines or by other means and the fuel supply reservoir has been drained and sealed. The fuel supply reservoir does not need to be cleaned or purged.

Notwithstanding above, dangerous goods required for the operation of the internal combustion engines or the vehicle or for the safety of the operator such as fire extinguishers, compressed gas cylinders, accumulators, airbag inflators, starter batteries, etc., shall be securely mounted. All other dangerous goods in the vehicle shall be separately packaged and consigned for transport, as appropriate, in accordance with this Code.

For fuel cell engines, all dangerous goods other than fuel and fuel cells shall be separately packaged and consigned for transport, as appropriate, in accordance with this Code."

SP 962 Replace 962 with the following:

"SP 962 internal combustion engines, vehicles, fuel cell engines, or battery powered equipment not meeting the conditions of special provision 961 shall be assigned to class 9 and shall meet the following requirements:

.1 internal combustion engines, vehicles, combustion engines, fuel cell engines or battery powered equipment shall not show signs of leakage from batteries, engines, fuel cells, compressed gas cylinders or accumulators, or fuel tank(s) when applicable;

.2 for flammable liquid powered vehicles and internal combustion engines the fuel tank(s) containing the flammable liquid shall not be more than one fourth full and in any case the flammable liquid shall not exceed 250 ℓ unless otherwise approved by the competent authority;

.3 for flammable gas powered vehicles and internal combustion engines, the fuel shut-off valve of the fuel tank(s) shall be securely closed;

.4 installed batteries shall be protected from damage, short circuit, and accidental activation during transport. Lithium ion or lithium metal batteries shall be of a type proved to meet the requirements of the United Nations Manual of Tests and Criteria, part III, subsection 38.3, unless otherwise approved by the competent authority; and

Notwithstanding above dangerous goods required for the operation of the internal combustion engines or the vehicle or for the safety of the operator

such as fire extinguishers, compressed gas accumulators, airbag inflators, starter batteries, etc., shall be securely mounted.

The provisions of this Code relevant to marking, labelling, placarding and marine pollutants shall not apply."

SP 963 Replace the words "column 16" with "columns 16a and 16b"

Insert the following new special provisions:

"367 For the purposes of documentation and package marking:

The proper shipping name "Paint related material" may be used for consignments of packages containing "Paint" and "Paint related material" in the same package;

The proper shipping name "Paint related material, corrosive, flammable" may be used for consignments of packages containing "Paint, corrosive, flammable" and "Paint related material, corrosive, flammable" in the same package;

The proper shipping name "Paint related material, flammable, corrosive" may be used for consignments of packages containing "Paint, flammable, corrosive" and "Paint related material, flammable, corrosive" in the same package; and

The proper shipping name "Printing ink related material" may be used for consignments of packages containing "Printing Ink" and "Printing ink related material" in the same package."

"368 In the case of non-fissile or fissile-excepted uranium hexafluoride, the material shall be classified under UN 3507 or UN 2978."

"369 In accordance with 2.0.3.5, this radioactive material in an excepted package possessing corrosive properties is classified in Class 8 with a radioactive material subsidiary risk.

Uranium hexafluoride may be classified under this entry only if the conditions of 2.7.2.4.1.2, 2.7.2.4.1.5, 2.7.2.4.5.2 and, for fissile-excepted material, of 2.7.2.3.6 are met.

In addition to the provisions applicable to the transport of Class 8 substances, the provisions of 5.1.3.2, 5.1.5.2.2, 5.1.5.4.1.2, 7.1.4.5.9, 7.1.4.5.10, 7.1.4.5.12, and 7.8.4.1 to 7.8.4.6 shall apply.

No Class 7 label is required to be displayed."

"370 This entry applies to:

- ammonium nitrate with more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any added substance; and

- ammonium nitrate with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any added substance, that is not too sensitive for acceptance into

Class 1 when tested in accordance with Test Series 2 (see Manual of Tests and Criteria, Part I). See also UN No. 1942."

"371 .1 This entry also applies to articles, containing a small pressure receptacle with a release device. Such articles shall comply with the following requirements:

(a) The water capacity of the pressure receptacle shall not exceed 0.5 litres and the working pressure shall not exceed 25 bar at 15°C;

(b) The minimum burst pressure of the pressure receptacle shall be at least four times the pressure of the gas at 15°C;

(c) Each article shall be manufactured in such a way that unintentional firing or release is avoided under normal conditions of handling, packing, transport and use. This may be fulfilled by an additional locking device linked to the activator;

(d) Each article shall be manufactured in such a way as to prevent hazardous projections of the pressure receptacle or parts of the pressure receptacle;

(e) Each pressure receptacle shall be manufactured from material which will not fragment upon rupture;

(f) The design type of the article shall be subjected to a fire test. For this test, the provisions of paragraphs 16.6.1.2 except letter g, 16.6.1.3.1 to 16.6.1.3.6, 16.6.1.3.7 (b) and 16.6.1.3.8 of the Manual of Tests and Criteria shall be applied. It shall be demonstrated that the article relieves its pressure by means of a fire degradable seal or other pressure relief device, in such a way that the pressure receptacle will not fragment and that the article or fragments of the article do not rocket more than 10 m;

(g) The design type of the article shall be subjected to the following test. A stimulating mechanism shall be used to initiate one article in the middle of the packaging. There shall be no hazardous effects outside the package such as disruption of the package, metal fragments or a receptacle which passes through the packaging.

.2 The manufacturer shall produce technical documentation of the design type, manufacture as well as the tests and their results. The manufacturer shall apply procedures to ensure that articles produced in series are made of good quality, conform to the design type and are able to meet the requirements in .1. The manufacturer shall provide such information to the Competent Authority on request."

"372 This entry applies to asymmetric capacitors with an energy storage capacity greater than 0.3 Wh. Capacitors with an energy storage capacity of 0.3 Wh or less are not subject to the provisions of this Code.

Energy storage capacity means the energy stored in a capacitor, as calculated according to the following equation,

$$Wh = 1/2C_N(U_R^2-U_L^2) \times (1/3600),$$

using the nominal capacitance (C_N), rated voltage (U_R) and rated lower limit voltage (U_L).

All asymmetric capacitors to which this entry applies shall meet the following conditions:

(a) Capacitors or modules shall be protected against short circuit;

(b) Capacitors shall be designed and constructed to safely relieve pressure that may build up in use, through a vent or a weak point in the capacitor casing. Any liquid which is released upon venting shall be contained by packaging or by equipment in which a capacitor is installed;

(c) Capacitors shall be marked with the energy storage capacity in Wh, except those manufactured before 1 January 2016;

(d) Capacitors containing an electrolyte meeting the classification criteria of any class or division of dangerous goods shall be designed to withstand a 95 kPa pressure differential;

Capacitors containing an electrolyte not meeting the classification criteria of any class or division of dangerous goods, including when configured in a module or when installed in equipment are not subject to other provisions of this Code. Capacitors containing an electrolyte meeting the classification criteria of any class or division of dangerous goods, with an energy storage capacity of 20 Wh or less, including when configured in a module, are not subject to other provisions of this Code when the capacitors are capable of withstanding a 1.2 metre drop test unpackaged on an unyielding surface without loss of contents.

Capacitors containing an electrolyte meeting the classification criteria of any class or division of dangerous goods that are not installed in equipment and with an energy storage capacity of more than 20 Wh are subject to this Code.

Capacitors installed in equipment and containing an electrolyte meeting the classification criteria of any class or division of dangerous goods, are not subject to other provisions of these Regulations provided that the equipment is packaged in a strong outer packaging constructed of suitable material, and of adequate strength and design, in relation to the packaging's intended use and in such a manner as to prevent accidental functioning of capacitors during transport. Large robust equipment containing capacitors may be offered for transport unpackaged or on pallets when capacitors are afforded equivalent protection by the equipment in which they are contained.

Note: Notwithstanding the provisions of this special provision, nickel-carbon asymmetric capacitors containing Class 8 alkaline electrolytes shall be transported as UN 2795, BATTERIES, WET, FILLED WITH ALKALI, electric storage."

"373 Neutron radiation detectors containing non-pressurized boron trifluoride gas may be transported under this entry provided that the following conditions are met:

.1 Each radiation detector shall meet the following conditions.

(i) The pressure in each detector shall not exceed 105 kPa absolute at 20°C;

(ii) The amount of gas shall not exceed 13 g per detector;

(iii) Each detector shall be manufactured under a registered quality assurance programme;

NOTE: The application of ISO 9001:2008 may be considered acceptable for this purpose.

(iv) Each neutron radiation detector shall be of welded metal construction with brazed metal to ceramic feed through assemblies. These detectors shall have a minimum burst pressure of 1800 kPa as demonstrated by design type qualification testing; and

(v) Each detector shall be tested to a 1 x 10^{-10} cm^3/s leaktightness standard before filling.

.2 Radiation detectors transported as individual components shall be transported as follows:

(i) Detectors shall be packed in a sealed intermediate plastics liner with sufficient absorbent material to absorb the entire gas contents;

(ii) They shall be packed in strong outer packaging. The completed package shall be capable of withstanding a 1.8 m drop test without leakage of gas contents from detectors;

(iii) The total amount of gas from all detectors per outer packaging shall not exceed 52 g.

.3 Completed neutron radiation detection systems containing detectors meeting the conditions of paragraph (a) shall be transported as follows:

(i) The detectors shall be contained in a strong sealed outer casing;

(ii) The casing shall contain sufficient absorbent material to absorb the entire gas contents;

(iii) The completed systems shall be packed in strong outer packagings capable of withstanding a 1.8 m drop test without leakage unless a system's outer casing affords equivalent protection.

Packing instruction P200 of 4.1.4.1 is not applicable.

The transport document shall include the following statement "Transport in accordance with special provision 373".

Neutron radiation detectors containing not more than 1 g of boron trifluoride, including those with solder glass joints, are not subject to this Code provided they

meet the requirements in paragraph .1 and are packed in accordance with paragraph .2. Radiation detection systems containing such detectors are not subject to this Code provided they are packed in accordance with paragraph .3.

Nuclear radiation detectors shall be stowed in accordance with stowage Category A."

"SP 376 Lithium ion cells or batteries and lithium metal cells or batteries identified as being damaged or defective such that they do not conform to the type tested according to the applicable provisions of the Manual of Tests and Criteria shall comply with the requirements of this special provision.

For the purposes of this special provision, these may include, but are not limited to:

- Cells or batteries identified as being defective for safety reasons;

- Cells or batteries that have leaked or vented;

- Cells or batteries that cannot be diagnosed prior to transport; or

- Cells or batteries that have sustained physical or mechanical damage.

NOTE: In assessing a battery as damaged or defective, the type of battery and its previous use and misuse shall be taken into account.

Cells and batteries shall be transported according to the provisions applicable to UN 3090, UN 3091, UN 3480 and UN 3481, except special provision 230 and as otherwise stated in this special provision.

Packages shall be marked "DAMAGED/DEFECTIVE LITHIUM-ION BATTERIES" or "DAMAGED/DEFECTIVE LITHIUM METAL BATTERIES", as applicable.

Cells and batteries shall be packed in accordance with packing instructions P908 of 4.1.4.1 or LP904 of 4.1.4.3, as applicable.

Cells and batteries liable to rapidly disassemble, dangerously react, produce a flame or a dangerous evolution of heat or a dangerous emission of toxic, corrosive or flammable gases or vapours under normal conditions of transport shall not be transported except under conditions specified by the competent authority."

"SP 377 Lithium ion and lithium metal cells and batteries and equipment containing such cells and batteries transported for disposal or recycling, either packed together with or packed without non-lithium batteries, may be packaged in accordance with packing instruction P909 of 4.1.4.1.

These cells and batteries are not subject to the requirements of section 2.9.4.

Packages shall be marked "LITHIUM BATTERIES FOR DISPOSAL" or "LITHIUM BATTERIES FOR RECYCLING".

Identified damaged or defective batteries shall be transported in accordance with special provision 376 and packaged in accordance with P908 of 4.1.4.1 or LP904 of 4.1.4.3, as applicable."

"SP 968 This entry shall not be used for sea transport. Discarded packaging shall meet the requirements of 4.1.1.11."

"SP 969 Substances classified in accordance to 2.9.3 are subject to the provisions for marine pollutants. Substances which are transported under UN 3077 and 3082 but which do not meet the criteria of 2.9.3 (see 2.9.2.2) are not subject to the provisions for marine pollutants. However for substances that are identified as marine pollutants in this Code (see Index) but which no longer meet the criteria of 2.9.3, the provisions of 2.10.2.6 apply."

"SP 970 This entry only applies to internal combustion engines (including machinery or equipment powered by such engines) to fuel cell engines, and to vehicles powered by flammable liquid, flammable gas and fuel cells containing flammable liquid or gas (including hybrid electric vehicles, see SP 312 or SP 240). For the purposes of this entry vehicles are defined as road vehicles (e.g. cars, motorcycles), boats, aircraft, wheeled or tracked construction or farming equipment and any other self-propelled apparatus designed to carry one or more persons or goods. For internal combustion engines where the requirement of Special Provisions 961 or 962 are not met, an appropriate name and description shall be selected and the relevant provisions of this Code shall apply. If a vehicle is powered by a flammable liquid and a flammable gas internal combustion engine, it shall be assigned to UN 3166 VEHICLE, FLAMMABLE GAS POWERED."

Chapter 3.4 – Dangerous goods packed in limited quantities

3.4.1 General

3.4.1.2 In subparagraph ".5" delete the reference "5.3.2.3".

3.4.3 Stowage

3.4.3 In the paragraph, replace the words "column 16" with "column 16a".

3.4.4 Segregation

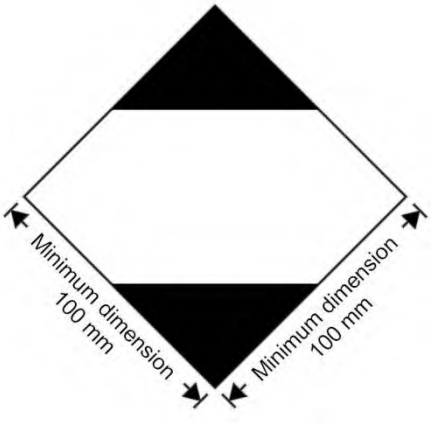
3.4.4.1 In subparagraph ".2" replace the words "column 16" with "column 16b"

3.4.5 Marking and placarding

Amend section 3.4.5.1 and 3.4.5.2 to read as follows:

"**3.4.5 Marking and Placarding**

3.4.5.1 Except for air transport, packages containing dangerous goods in limited quantities shall bear the marking shown below:



Marking for packages containing limited quantities

The marking shall be readily visible, legible and able to withstand open weather exposure without a substantial reduction in effectiveness. The marking shall be in the form of a square set at an angle of 45° (diamond-shaped). The top and bottom portions and the surrounding line shall be black. The centre area shall be white or a suitable contrasting background. The minimum dimensions shall be 100 mm x 100 mm and the minimum width of the line forming the diamond shall be 2 mm. Where dimensions are not specified, all features shall be in approximate proportion to those shown. If the size of the package so requires, the minimum outer dimensions shown above may be reduced to be not less than 50 mm x 50 mm provided the marking remains clearly visible. The minimum width of the line forming the diamond may be reduced to a minimum of 1 mm.

NOTE: The provisions of 3.4.5.1 of the IMDG Code amendment 36-12 may continue to be applied until 31 December 2016."

3.4.5.2 Packages containing dangerous goods packed in conformity with the provisions of Part 3, Chapter 4 of the ICAO Technical Instructions for the Transport of Dangerous Goods may bear the marking shown below to certify conformity with these provisions:

Marking for packages containing limited quantities conforming to Part 3, Chapter 4 of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air.

The marking shall be readily visible, legible and able to withstand open weather exposure without a substantial reduction in effectiveness. The marking shall be in the form of a square set at an angle of 45° (diamond-shaped). The top and bottom portions and the surrounding line shall be black. The centre area shall be white or a suitable contrasting background. The minimum dimensions shall be 100 mm x 100 mm and the minimum width of the line forming the diamond shall be 2 mm. The symbol "Y" shall be placed in the centre of the mark and shall be clearly visible. Where dimensions are not specified, all features shall be in approximate proportion to those shown. If the size of the package so requires, the minimum outer dimensions shown above may be reduced to be not less than 50 mm x 50 mm provided the marking remains clearly visible. The minimum width of the line forming the diamond may be reduced to a minimum of 1 mm. The symbol "Y" shall remain in approximate proportion to that shown above.

Note: The provisions of 3.4.5.2 of IMDG Code (amendment 36-12) may continue to be applied until 31 December 2016."

3.4.5.3 Amend to read as follows:

"**3.4.5.3 Multimodal recognition of marks**

3.4.5.3.1 Packages containing dangerous goods bearing the marking shown in 3.4.5.2 with or without the additional labels and markings for air transport shall be deemed to meet the provisions of section 3.4.2 and need not bear the marking shown in 3.4.5.1.

3.4.5.3.2 Packages containing dangerous goods in limited quantities bearing the marking shown in 3.4.5.1 and conforming with the provisions of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air, including all necessary marks and labels specified in Parts 5 and 6, shall be deemed to meet the provisions of section 3.4.1 as appropriate and of section 3.4.2."

3.4.5.5 Placarding and marking of cargo transport units

3.4.5.5.3 Delete the existing paragraph and insert "reserve"

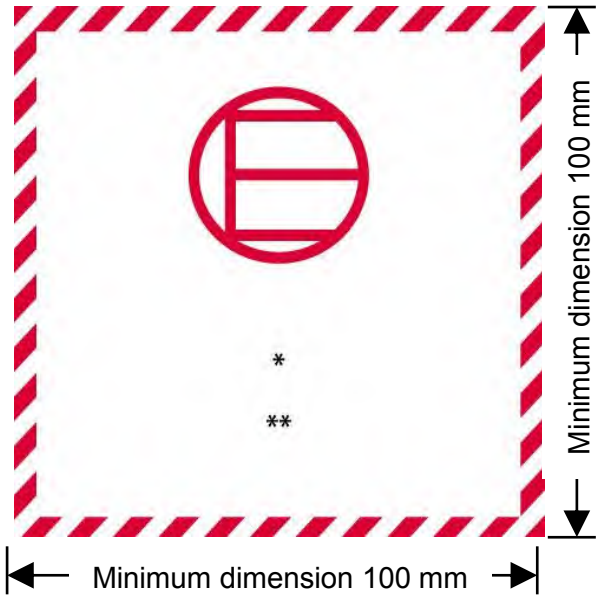
Chapter 3.5 – Dangerous goods packed in excepted quantities

3.5.4 Marking of packages

3.5.4.1 Delete the mark and the text below the mark.

3.5.4.2 and 3.5.4.3 Amend to read as follows:

"**3.5.4.2**



Excepted quantities mark

* The Class or, when assigned, the Division number(s) 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.

The marking shall be in the form of a square. The hatching and symbol shall be of the same colour, black or red, on white or suitable contrasting background. The minimum dimensions shall be 100 mm x 100 mm. Where dimensions are not specified, all features shall be in approximate proportion to those shown.

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.

Note: The provisions of 3.5.4.1 and 3.5.4.2 of the IMDG Code (amendment 36-12) may continue to be applied until 31 December 2016."

3.5.7 Stowage

3.5.7.1 In the paragraph, replace the words "column 16" with "column 16a"

3.5.8 Segregation

3.5.8.1 In the paragraph, replace the words "column 16" with "column 16b"

3.5.8.2 In the paragraph, replace the words "column 16" with "column 16b"

Appendix A – List of generic and N.O.S. Proper Shipping Names

Add the following new entries in appendix A under the appropriate class in the general entries section:

Class or Division	Subsidiary Risk	UN No	Proper Shipping Name
2.1		3510	ADSORBED GAS, FLAMMABLE, N.O.S.
2.2		3511	ADSORBED GAS, N.O.S.
2.3		3512	ADSORBED GAS, TOXIC, N.O.S.
2.2	5.1	3513	ADSORBED GAS, OXIDIZING, N.O.S.
2.3	2.1	3514	ADSORBED GAS, TOXIC, FLAMMABLE, N.O.S.
2.3	5.1	3515	ADSORBED GAS, TOXIC, OXIDIZING, N.O.S.
2.3	8	3516	ADSORBED GAS, TOXIC, CORROSIVE, N.O.S.
2.3	2.1 + 8	3517	ADSORBED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.
2.3	5.1 + 8	3518	ADSORBED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.

Appendix B – Glossary of terms

Amend the entry for "AIR BAG INFLATORS, PYROTECHNIC or AIR BAG MODULES, PYROTECHNIC or SEAT-BELT PRETENSIONERS, PYROTECHNIC" to read:

"SAFETY DEVICES, electrically initiated".

Amend the definition to read as follows:

"Articles which contain pyrotechnic substances or dangerous goods of other classes and are used in vehicles, vessels or aircraft to enhance safety to persons. Examples are: air bag inflators, air bag modules, seat-belt pretensioners and pyromechanical devices. These pyromechanical devices are assembled components for tasks such as but not limited to separation, locking, or release-and-drive or occupant restraint. The term includes "SAFETY DEVICES, PYROTECHNIC"."

Alphabetical index

Amend the following entries as indicated hereunder:

Amend the entries for "AIR BAG INFLATORS, PYROTECHNIC or AIR BAG MODULES, PYROTECHNIC or SEAT-BELT PRETENSIONERS, PYROTECHNIC" to read as follows:

«Air bag inflators, see	1.4G 9	0503 3268»
«Air bag modules, see	1.4G 9	0503 3268»
«Seat-belt pretensioners, see	1.4G 9	0503 3268»

In the entries for "Actinolite", "Anthophyllite" and "Tremolite" in the UN No. column, replace "2590" with "2212".

Delete the entries for "Asbestos, blue or brown", "Asbestos, white", "Chryosotile", , "BLUE ASBESTOS (crocidolite)", "BROWN ASBESTOS (amosite, mysorite)", "WHITE ASBESTOS (chrysotile, actinolite, anthophyllite, tremolite)". (delete entries regardless names in the UN Regulations differs from those in the IMDG Code)

In the entry for "TRIFLUOROCHLOROETHYLENE, STABILIZED" UN No. 1082, add at the end "(REFRIGERANT GAS R 1113)".

In the entry for "AMMONIUM NITRATE", (UN 1942), amend the description to read as follows "AMMONIUM NITRATE with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance".

In the entry for "AMMONIUM NITRATE", (UN 0222), amend the description to read as follows "AMMONIUM NITRATE".

In the entry for "CAPACITOR, electric double layer…" (UN 3499), amend the description to read as follows: "CAPACITOR, ELECTRIC DOUBLE LAYER (with an energy storage capacity greater than 0.3Wh)".

Drazoxolon: Replace "see PESTICIDE, N.O.S." with "see ORGANOCHLORINE PESTICIDE".

Kelevan: Replace "see PESTICIDE, N.O.S." with "see ORGANOCHLORINE PESTICIDE".

Nabam: Replace "see THIOCARBAMATE PESTICIDE" with "see Note 1".

Oxamyl: Replace "see PESTICIDE, N.O.S." with "see CARBAMATE PESTICIDE".

In the entry for "AMMONIA, ANHYDROUS", UN (1005), insert "P" in the column for MP.

In the entries for "ALLYL ALCOHOL" and "Propenyl alcohol", UN (1098), insert "P" in the column for MP.

In the entry for "HEPTANES", UN (1206), insert "P" in the column for MP.

In the entries for "Hexane" and "2-Methylpentane", UN (1208), insert "P" in the column for MP.

In the entries for "Isooctane", "2-Methylheptane", "OCTANES" and "2,2,4-Trimethylpentane", UN (1262), insert "P" in the column for MP.

In the entry for "PINE OIL", UN (1272), insert "P" in the column for MP.

In the entry for "TURPENTINE", UN (1299), insert "P" in the column for MP.

In the entries for "Creosote salts", "NAPHTHALENE, CRUDE" and "NAPHTHALENE, REFINED", UN (1334), insert "P" in the column for MP.

In the entries for "Aminobenzene", "ANILINE", "Aniline oil" and "Phenylamine", UN (1547), insert "P" in the column for MP.

In the entries for "Methyldinitrobenzenes, molten" and "DINITROTOLUENES, MOLTEN", UN (1600), insert "P" in the column for MP.

In the entry for "TOLUIDINES, LIQUID", UN (1708), insert "P" in the column for MP.

In the entries for "CALCIUM HYPOCHLORITE, DRY with more than 39% available chlorine (8.8% available oxygen)" and "CALCIUM HYPOCHLORITE MIXTURE, DRY with more than 39% available chlorine (8.8% available oxygen", UN (1748), insert "P" in the column for MP.

In the entry for "Sodium hypochlorite solution ", UN (1791), insert "P" in the column for MP.

In the entry for "ZINC CHLORIDE SOLUTION", UN (1840), insert "P" in the column for MP.

In the entry for "NONANES", UN (1920), insert "P" in the column for MP.

Insert a new entry "2,4-Dichlorophenol,see," in the column for Substance, material or article, "P" in the column for MP, "6.1" in the column for Class, "2020" in the column for UN No..

In the entry for "DINITROTOLUENES, LIQUID" and "Methyldinitrobenzenes, liquid", UN (2038), insert "P" in the column for MP.

Insert a new entry "1,3-Dichloropropene, see" in the column for Substance, material or article, "P" in the column for MP, "3" in the column for Class, "2047" in the column for UN No..

In the entry for "AMMONIA SOLUTION relative density less than 0.880 at 15°C in water, with more than 35% but not more than 50% ammonia", UN (2073), insert "P" in the column for MP.

In the entries for "Bleaching powder" and "CALCIUM HYPOCHLORITE MIXTURE, DRY with more than 10% but not more than 39% available chlorine", UN (2208), insert "P" in the column for MP.

In the entries for "Propenoic acid, stabilized", "Acroleic acid, stabilized" and "ACRYLIC ACID, STABILIZED", UN (2218), insert "P" in the column for MP.

In the entries for "meta-Chlorotoluene" and "para-Chlorotoluene", delete "P", and in the entry for "ortho-Chlorotoluene", UN (2238) insert "P" in the column for MP.

In the entry for "CYCLOHEPTANE", UN (2241), insert "P" in the column for MP.

In the entry for "NAPHTHALENE, MOLTEN", UN (2304), insert "P" in the column for MP.

In the entries for "1,3,5-TRIMETHYLBENZENE" and "Mesitylene", UN (2325), insert "P" in the column for MP.

In the entry for "ZINC CHLORIDE, ANHYDROUS", UN (2331), insert "P" in the column for MP.

In the entry for "alpha-PINENE", UN (2368), insert "P" in the column for MP.

In the entries for "DIMETHYL DISULPHIDE", "Methyl disulphide" and "Methyldithiomethane", UN (2381), insert "P" in the column for MP.

In the entry for "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, by mass", UN (2672), insert "P" in the column for MP.

In the entries for "BUTYLBENZENES", "Isobutylbenzene", "2-Methyl-2-phenylpropane", "1-Phenylbutane" and "2-Phenylbutane", UN (2709), insert "P" in the column for MP.

In the entries for "Dodecene", "PROPYLENE TETRAMER" and "Tetrapropylene", UN (2850), insert "P" in the column for MP.

In the entries for "CALCIUM HYPOCHLORITE, HYDRATED with not less than 5.5% but not more than 16% water" and "CALCIUM HYPOCHLORITE, HYDRATED MIXTURE with not less than 5.5% but not more than 16% water", UN (2880), insert "P" in the column for MP.

In the entry for "AMMONIA SOLUTION relative density less than 0.880 at 15° C in water, with more than 50% ammonia", UN (3318), insert "P" in the column for MP.

In the entry for "TOLUIDINES, SOLID", UN (3451), insert "P" in the column for MP.

In the entries for "DINITROTOLUENES, SOLID" and "Methyldinitrobenzenes, solid", UN (3454), insert "P" in the column for MP.

In the entry for "CALCIUM HYPOCHLORITE MIXTURE, DRY, CORROSIVE with more than 39% available chlorine (8.8% available oxygen)", UN (3485), insert "P" in the column for MP.

In the entry for "CALCIUM HYPOCHLORITE MIXTURE, DRY, CORROSIVE with more than 10% but not more than 39% available chlorine", UN (3486), insert "P" in the column for MP.

In the entries for "CALCIUM HYPOCHLORITE, HYDRATED MIXTURE, CORROSIVE with not less than 5.5% but not more than 16% water" and "CALCIUM HYPOCHLORITE, HYDRATED, CORROSIVE with not less than 5.5% but not more than 16% water", UN (3487), insert "P" in the column for MP.

Add the following new entries in alphabetical order:

Name and description	*Class*	*UN No.*
ADSORBED GAS, FLAMMABLE, N.O.S.	2.1	3510
ADSORBED GAS, N.O.S.	2.2	3511
ADSORBED GAS, OXIDIZING, N.O.S.	2.2	3513
ADSORBED GAS, TOXIC, CORROSIVE, N.O.S.	2.3	3516
ADSORBED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	2.3	3517
ADSORBED GAS, TOXIC, FLAMMABLE, N.O.S.	2.3	3514
ADSORBED GAS, TOXIC, N.O.S.	2.3	3512
ADSORBED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	2.3	3518
ADSORBED GAS, TOXIC, OXIDIZING, N.O.S.	2.3	3515
Amphibole asbestos, see	9	2212
ARSINE, ADSORBED	2.3	3522
ASBESTOS, AMPHIBOLE	9	2212
ASBESTOS, CHRYSOTILE	9	2590
BORON TRIFLUORIDE, ADSORBED	2.3	3519
CAPACITOR, ASYMMETRIC, (with an energy storage capacity greater than 0.3Wh)	9	3508
CHLORINE, ADSORBED	2.3	3520
Chrysotile, see	9	2590
GERMANE, ADSORBED	2.3	3523
HYDROGEN SELENIDE, ADSORBED	2.3	3526

Name and description	*Class*	*UN No.*
Mercurous chloride, see	6.1	2025
PACKAGING DISCARDED, EMPTY, UNCLEANED	9	3509
PHOSPHINE, ADSORBED	2.3	3525
PHOSPHORUS PENTAFLUORIDE, ADSORBED	2.3	3524
SAFETY DEVICES, electrically initiated	9	3268
SAFETY DEVICES, PYROTECHNIC	1.4G	0503
SILICON TETRAFLUORIDE, ADSORBED	2.3	3521
URANIUM HEXAFLUORIDE, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE, less than 0.1 kg per package, non-fissile or fissile-excepted	8	3507
Talcum with tremolite and/or actinolite, see	9	2212

PART 4
PACKING AND TANK PROVISIONS

Chapter 4.1 – Use of packagings, including intermediate bulk containers (IBCs) and large packagings

4.1.1 General provisions for the packing of dangerous goods in packagings, including IBCs and large packagings

4.1.1.3 In paragraph 4.1.1.3, in the third line, the reference "6.3.2" is replaced with "6.3.5".

4.1.1.5.2 Insert a new 4.1.1.5.2 to read as follows:

"4.1.1.5.2 Use of supplementary packagings within an outer packaging (e.g. an intermediate packaging or a receptacle inside a required inner packaging) additional to what is required by the packing instructions is authorized provided all relevant requirements are met, including those of 4.1.1.3, and, if appropriate, suitable cushioning is used to prevent movement within the packaging."

and the remaining paragraphs are renumbered accordingly.

4.1.4 List of packing instructions

4.1.4.1 Packing instructions concerning the use of packagings (except IBCs and large packagings)

P001 Insert a new last sentence in subparagraph (a) of PP1 as follows

"On roll-on/roll-off ships the unit loads may be carried in vehicles other than closed vehicles provided they are securely fenced to the full height of the cargo carried;"

P003 Add a new special packing provision PP91 to read as follows:

"PP91 For UN 1044, large fire extinguishers may also be transported unpackaged provided that the requirements of 4.1.3.8.1.1 to 4.1.3.8.1.5 are met, the valves are protected by one of the methods in accordance with 4.1.6.1.8.1 to 4.1.6.1.8.4 and other equipment mounted on the fire extinguisher is protected to prevent accidental activation. For the purpose of this special packing provision, "large fire extinguishers" means fire extinguishers as described in subparagraphs .3 to .5 of special provision 225 of Chapter 3.3."

P114(a) Under Outer Packagings, Drums: Before "fibre (1G)" insert "plywood (1D)".

P116 In the column for "outer packagings", amend the first entry for "bags" to read: "woven plastics (5H1, 5H2, 5H3)". Amend special packing provision PP65 to read: "*Deleted*".

P131 and P137 In the entry for "boxes", in the column for "outer packagings" add: "plastics, solid (4H2)".

P404 (1) Amend to read as follows:

(1)	**Combination packagings**	
	Outer packagings:	(1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2)
	Inner packagings:	Metal receptacles with a maximum net mass of 15 kg each. Inner packagings shall be hermetically sealed and have threaded closures; Glass receptacles, with a maximum net mass of 1 kg each, having threaded closures with gaskets, cushioned on all sides and contained in hermetically sealed metal cans.
	Outer packagings shall have a maximum net mass of 125 kg.	

P501, P502 and P504 Amend the last entry under "Composite packaging" to read as follows:

"Glass receptacle in steel, aluminium, fibre or plywood drum (6PA1, 6PB1, 6PD1 or 6PG1) or in a steel, aluminium, wood or fibreboard box or in wickerwork hamper (6PA2, 6PB2, 6PC, 6PG2 or 6PD2) or in solid or expanded plastics packaging (6PH1 or 6PH2)."

P601 (2) and P602 (2) At the beginning, insert "or plastics" after "consisting of metal".

P650 Amend the diagram in paragraph (4) to read as follows:

P802 (3) Amend to read as follows:

"(3) Composite packagings: Glass receptacle in steel, aluminium or plywood drum (6PA1, 6PB1 or 6PD1) or in a steel, aluminium or wood box or in wickerwork hamper (6PA2, 6PB2, 6PC or 6PD2) or in solid plastics packaging (6PH2); maximum capacity: 60 litres."

P901 After "(see 3.3.1, special provision 251)", insert the following new sentence: "Where the kit contains only dangerous goods to which no packing group is assigned, packagings shall meet Packing Group II performance level."

P903 In paragraph (2), replace subparagraphs (a) and (b) with the following subparagraphs (a) to (c):

"(a) Strong outer packagings;

(b) Protective enclosures (e.g. fully enclosed or wooden slatted crates); or

(c) Pallets or other handling devices."

P904 Amend the diagram to read as follows:

P906 (2) Amend to read as follows:

"(2) For transformers and condensers and other devices:

(a) Packagings in accordance with packing instructions P001 or P002. The articles shall be secured with suitable cushioning material to prevent inadvertent movement during normal conditions of transport; or

(b) Leakproof packagings which are capable of containing, in addition to the devices, at least 1.25 times the volume of the liquid PCBs, polyhalogenated biphenyls or terphenyls present in them. There shall be sufficient absorbent material in the packagings to absorb at least 1.1 times the volume of liquid which is contained in the devices. In general, transformers and condensers shall be carried in leakproof metal packagings which are capable of holding, in addition to the transformers and condensers, at least 1.25 times the volume of the liquid present in them."

Insert the following new packing instructions:

P208	PACKING INSTRUCTION	P208

This instruction applies to Class 2 adsorbed gases.

(1) The following packagings are authorized provided the general packing requirements of 4.1.6.1 are met:

Cylinders specified in Chapter 6.2 and in accordance with ISO 11513:2011 or ISO 9809-1:2010.

(2) The pressure of each filled cylinder shall be less than 101.3 kPa at 20°C and less than 300 kPa at 50°C.

(3) The minimum test pressure of the cylinder shall be 21 bar.

(4) The minimum burst pressure of the cylinder shall be 94.5 bar.

(5) The internal pressure at 65°C of the filled cylinder shall not exceed the test pressure of the cylinder.

(6) The adsorbent material shall be compatible with the cylinder and shall not form harmful or dangerous compounds with the gas to be adsorbed. The gas in combination with the adsorbent material shall not affect or weaken the cylinder or cause a dangerous reaction (e.g. a catalyzing reaction).

(7) The quality of the adsorbent material shall be verified at the time of each fill to assure the pressure and chemical stability requirements of this packing instruction are met each time an adsorbed gas package is offered for transport.

(8) The adsorbent material shall not meet the criteria of any of the Classes or Divisions in this Code.

(9) Requirements for cylinders and closures containing toxic gases with an LC_{50} less than or equal to 200 ml/m^3 (ppm) (see table 1) shall be as follows:

(a) Valve outlets shall be fitted with pressure retaining gas-tight plugs or caps having threads matching those of the valve outlets.

(b) Each valve shall either be of the packless type with non-perforated diaphragm, or be of a type which prevents leakage through or past the packing.

(c) Each cylinder and closure shall be tested for leakage after filling.

(d) Each valve shall be capable of withstanding the test pressure of the cylinder and be directly connected to the cylinder by either a taper-thread or other means which meets the requirements of ISO 10692-2:2001.

(e) Cylinders and valves shall not be fitted with a pressure relief device.

(10) Valve outlets for cylinders containing pyrophoric gases shall be fitted with gas-tight plugs or caps having threads matching those of the valve outlets.

(11) The filling procedure shall be in accordance with Annex A of ISO 11513:2011.

(12) The maximum period for periodic inspections shall be 5 years.

(13) Special packing provisions that are specific to a substance (see table 1).

Material compatibility

a: Aluminum alloy cylinders shall not be used.

d: When steel cylinders are used, only those bearing the "H" mark in accordance with 6.2.2.7.4 (p) are permitted.

Gas specific provisions

r: The filling ratio of this gas shall be limited such that, if complete decomposition occurs, the pressure does not exceed two thirds of the test pressure of the cylinder.

Material Compatibility for N.O.S Adsorbed Gas Entries

z: The construction materials of the cylinders and their accessories shall be compatible with the contents and shall not react to form harmful or dangerous compounds therewith.

P208	PACKING INSTRUCTION				P208
Table 1: ADSORBED GASES					
UN No.	Name and description	Class or Division	Subsidiary risk	LC_{50} ml/m^3	Special packing provisions
(1)	(2)	(3)	(4)	(5)	(6)
3510	ADSORBED GAS, FLAMMABLE, N.O.S.	2.1			z
3511	ADSORBED GAS, N.O.S.	2.2			z
3512	ADSORBED GAS, TOXIC, N.O.S.	2.3		≤ 5000	z
3513	ADSORBED GAS, OXIDIZING, N.O.S.	2.2	5.1		z
3514	ADSORBED GAS, TOXIC, FLAMMABLE, N.O.S.	2.3	2.1	≤ 5000	z
3515	ADSORBED GAS, TOXIC, OXIDIZING, N.O.S.	2.3	5.1	≤ 5000	z
3516	ADSORBED GAS, TOXIC, CORROSIVE, N.O.S.	2.3	8	≤ 5000	z
3517	ADSORBED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	2.3	2.1 8	≤ 5000	z
3518	ADSORBED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	2.3	5.1 8	≤ 5000	z
3519	BORON TRIFLUORIDE, ADSORBED	2.3	8	387	a
3520	CHLORINE, ADSORBED	2.3	5.1 8	293	a
3521	SILICON TETRAFLUORIDE, ADSORBED	2.3	8	450	a
3522	ARSINE, ADSORBED	2.3	2.1	20	d
3523	GERMANE, ADSORBED	2.3	2.1	620	d, r
3524	PHOSPHORUS PENTAFLUORIDE, ADSORBED	2.3	8	190	
3525	PHOSPHINE, ADSORBED	2.3	2.1	20	d
3526	HYDROGEN SELENIDE, ADSORBED	2.3	2.1	2	

P505	**PACKING INSTRUCTION**	**P505**
This instruction applies to UN No. 3375		
The following packagings are authorized, provided that the general provisions of **4.1.1** and **4.1.3** are met:		
Combination packagings:	**Inner packaging maximum capacity**	**Outer packaging maximum net mass**
Boxes (4B, 4C1, 4C2, 4D, 4G, 4H2) or drums (1B2, 1G, 1N2, 1H2, 1D) jerricans (3B2, 3H2) with glass, plastics or metal inner packagings	5 l	125 kg
Single packagings:	**Maximum capacity**	
Drums		
aluminium (1B1, 1B2),	250 l	
plastics (1H1, 1H2)	250 l	
Jerricans		
aluminium (3B1, 3B2),	60 l	
plastics (3H1, 3H2)	60 l	
Composite packagings		
plastics receptacle with outer aluminium drum (6HB1)	250 l	
plastics receptacle with outer fibre, plastics or plywood drum (6HG1, 6HH1, 6HD1)	250 l	
plastics receptacle with outer aluminium crate or box or plastics receptacle with outer wooden, plywood, fibreboard or solid plastics box (6HB2, 6HC, 6HD2, 6HG2, 6HH2)	60 l	
glass receptacle with outer aluminium, fibre or plywood drum (6PB1, 6PG1, 6PD1) or with outer expanded plastics or solid plastics receptacles (6PH1, 6PH2) or with outer aluminium crate or box or with outer wooden or fibreboard box or with outer wickerwork hamper (6PB2, 6PC, 6PG2, 6PD2)	60 l	

P805	**PACKING INSTRUCTION**	**P805**
This instruction applies to UN 3507.		
The following packagings are authorized provided that the general provisions of **4.1.1** and **4.1.3** and the special packing provisions of **4.1.9.1.2**, **4.1.9.1.4** and **4.1.9.1.7** are met: Packagings consisting of: (a) Metal or plastics primary receptacle(s); in (b) Leakproof rigid secondary packaging(s); in (c) A rigid outer packaging: Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G); Boxes (4A, 4B, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A2, 3B2, 3H2).		
Additional requirements: 1. Primary inner receptacles shall be packed in secondary packagings in a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the secondary packaging. Secondary packagings shall be secured in outer packagings with suitable cushioning material to prevent movement. If multiple primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated so as to prevent contact between them.		

P805	PACKING INSTRUCTION	P805
2. The contents shall comply with the provisions of 2.7.2.4.5.2; 3. The provisions of 6.4.4 shall be met.		
Special packing provision: In the case of fissile-excepted material, limits specified in 2.7.2.3.5 and 6.4.11.2 shall be met.		

P908	PACKING INSTRUCTION	P908
This instruction applies to UN Nos. 3090, 3091, 3480 and 3481.		
The following packagings are authorized for damaged or defective lithium ion cells and batteries and lithium metal cells and batteries including those contained in equipment, provided the general provisions of 4.1.1 and 4.1.3 are met: For cells and batteries and equipment containing cells and batteries: Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G) Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2) Jerricans (3A2, 3B2, 3H2) Packagings shall conform to the packing group II performance level. 1. Each cell or battery or equipment containing such cells or batteries shall be individually packed in inner packaging and placed inside of an outer packaging. The inner packaging or outer packaging shall be leak-proof to prevent the potential release of electrolyte. 2. Each inner packaging shall be surrounded by sufficient non-combustible and non-conductive thermal insulation material to protect against a dangerous evolution of heat. 3. Sealed packagings shall be fitted with a venting device when appropriate. 4. Appropriate measures shall be taken to minimize the effects of vibrations and shocks, prevent movement of the cells or batteries within the package that may lead to further damage and a dangerous condition during transport. Cushioning material that is non-combustible and non-conductive may also be used to meet this requirement. 5. Non combustibility shall be assessed according to a standard recognized in the country where the packaging is designed or manufactured. For leaking cells or batteries, sufficient inert absorbent material shall be added to the inner or outer packaging to absorb any release of electrolyte. A cell or battery with a net mass of more than 30 kg shall be limited to one cell or battery per outer packaging.		
Additional requirements: Cells or batteries shall be protected against short circuit.		

P909	PACKING INSTRUCTION	P909

This instruction applies to UN Nos. 3090, 3091, 3480 and 3481 transported for disposal or recycling, either packed together with or packed without non-lithium batteries:

(1) Cells and batteries shall be packed in accordance with the following:

(a) The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3, are met:
Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);
Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H2); and
Jerricans (3A2, 3B2, 3H2).

(b) Packagings shall conform to the packing group II performance level.

(c) Metal packagings shall be fitted with a non-conductive lining material (e.g. plastics) of adequate strength for the intended use.

(2) However, lithium ion cells with a Watt-hour rating of not more than 20 Wh, lithium ion batteries with a Watt-hour rating of not more than 100 Wh, lithium metal cells with a lithium content of not more than 1 g and lithium metal batteries with an aggregate lithium content of not more than 2 g may be packed in accordance with the following:

(a) In strong outer packaging up to 30 kg gross mass meeting the general provisions of 4.1.1, except 4.1.1.3, and 4.1.3.

(b) Metal packagings shall be fitted with a non-conductive lining material (e.g. plastics) of adequate strength for the intended use.

(3) For cells or batteries contained in equipment, strong outer packagings constructed of suitable material, and of adequate strength and design in relation to the packaging capacity and its intended use, may be used. Packagings need not meet the requirements of 4.1.1.3. Large equipment may be offered for transport unpackaged or on pallets when the cells or batteries are afforded equivalent protection by the equipment in which they are contained.

(4) In addition, for cells or batteries with a gross mass of 12 kg or more employing a strong, impact resistant outer casing, strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packagings capacity and its intended use, may be used. Packagings need not meet the requirements of 4.1.1.3.

Additional requirements:

1. Cells and batteries shall be designed or packed to prevent short circuits and the dangerous evolution of heat.

2. Protection against short circuits and the dangerous evolution of heat includes, but is not limited to:

-individual protection of the battery terminals,

-inner packaging to prevent contact between cells and batteries,

-batteries with recessed terminals designed to protect against short circuits, or

-the use of a non-conductive and non-combustible cushioning material to fill empty space between the cells or batteries in the packaging.

3. Cells and batteries shall be secured within the outer packaging to prevent excessive movement during transport (e.g. by using a non-combustible and non-conductive cushioning material or through the use of a tightly closed plastics bag).

4.1.4.2 Packing instructions concerning the use of IBCs

In IBC02, insert the following new special provision B16:

"B16 For UN 3375, IBCs of type 31A and 31N are not allowed without competent authority approval."

In IBC04, replace "and 21N" with ", 21N, 31A, 31B and 31N".

In IBC05 (1), replace "and 21N" with ", 21N, 31A, 31B and 31N".

In IBC05 (2), replace "and 21H2" with ", 21H2, 31H1 and 31H2".

In IBC05 (3), replace "and 21HZ1" with ", 21HZ1 and 31HZ1".

In IBC06 (1), IBC07 (1) and IBC08 (1), replace "and 21N" with ", 21N, 31A, 31B and 31N".

In IBC06 (2), IBC07 (2) and IBC08 (2), replace "and 21H2" with ", 21H2, 31H1 and 31H2".

In IBC06 (3), IBC07 (3) and IBC08 (3), replace "and 21HZ2" with "21HZ2 and 31HZ1".

IBC100, in the first line of packing instruction IBC100, insert "0222" after "0082". Insert the following special packing provisions:

"B2 For UN No. 0222 in IBCs other than metal or rigid plastics IBCs, the IBCs shall be transported in closed cargo transport units."

"B3 For UN No. 0222, flexible IBCs shall be sift-proof and water resistant or shall be fitted with a sift-proof and water resistant liner."

"B17 For UN No. 0222, metal IBCs are not authorized."

4.1.4.3 Special packing instructions concerning the use of large packagings

Insert the following new packing instructions:

LP903	**PACKING INSTRUCTION**	**LP903**
This instruction applies to UN Nos. 3090, 3091, 3480 and 3481		
The following large packagings are authorized for a single battery, including for a battery contained in equipment, provided that the general provisions of **4.1.1** and **4.1.3** are met: Rigid large packagings conforming to the packing group II performance level, made of: steel (50A); aluminium (50B); metal other than steel or aluminium (50N); rigid plastics (50H); natural wood (50C); plywood (50D); reconstituted wood (50F); rigid fibreboard (50G). The battery shall be packed so that the battery is protected against damage that may be caused by its movement or placement within the large packaging.		
Additional requirement: Batteries shall be protected against short circuit.		

LP904	PACKING INSTRUCTION	LP904
This instruction applies to UN Nos. 3090, 3091, 3480 and 3481		
The following large packagings are authorized for a single damaged or defective battery and for a single damaged or defective battery contained in equipment, provided the general provisions of 4.1.1 and 4.1.3 are met For batteries and equipment containing batteries: steel (50A) aluminium (50B) metal other than steel or aluminium (50N) rigid plastics (50H) plywood (50D) Packagings shall conform to the packing group II performance level. 1. Each battery or equipment containing such battery shall be individually packed in an inner packaging and placed inside of an outer packaging. The inner packaging or outer packaging shall be leak-proof to prevent the potential release of electrolyte. 2. Each inner packaging shall be surrounded by sufficient non-combustible and non-conductive thermal insulation material to protect against a dangerous evolution of heat. 3. Sealed packagings shall be fitted with a venting device when appropriate. 4. Appropriate measures shall be taken to minimize the effects of vibrations and shocks, prevent movement of the battery within the package that may lead to further damage and a dangerous condition during transport. Cushioning material that is non-combustible and non-conductive may also be used to meet this requirement. 5. Non combustibility shall be assessed according to a standard recognized in the country where the packaging is designed or manufactured. For leaking batteries, sufficient inert absorbent material shall be added to the inner or outer packaging to absorb any release of electrolyte.		
Additional requirements: Batteries shall be protected against short circuit**.**		

4.1.6 Special packing provisions for goods of class 2

4.1.6.1 General provisions

4.1.6.1.2 Replace "ISO 11114-1:1997" with "ISO 11114-1:2012".

4.1.9 Special packing provisions for class 7

4.1.9.1 General

4.1.9 Amend the title to read "Special packing provisions for radioactive material"

4.1.9.1.3 Delete ", other than an excepted package,".

4.1.9.1.6 Amend the introductory sentence to read as follows:

"Before a packaging is first used to transport radioactive material, it shall be confirmed that it has been manufactured in conformity with the design specifications to ensure compliance with the relevant provisions of is Code and any applicable certificate of approval. The following requirements shall also be fulfilled, if applicable:".

In subparagraph .1, replace "package" with "packaging".

In subparagraph .2, amend the beginning of the sentence to read as follows:

"For each packaging intended for use as a Type B(U), Type B(M) or Type C package and for each packaging intended to contain fissile material …".

In subparagraph.3, amend the text to read as follows:

".3 For each packaging intended to contain fissile material, it shall be ensured that the effectiveness of the criticality safety features is within the limits applicable to or specified for the design and in particular where, in order to comply with the requirements of 6.4.11.1 neutron poisons are specifically included, checks shall be performed to confirm the presence and distribution of those neutron poisons."

4.1.9.1.7 Insert a new paragraph to read as follows:

"4.1.9.1.7 Before each shipment of any package, it shall be ensured that the package contains neither:

.1 Radionuclides different from those specified for the package design; nor

.2 Contents in a form, or physical or chemical state different from those specified for the package design."

Current paragraphs 4.1.9.1.7 to 4.1.9.1.11 become new paragraphs 4.1.9.1.8 to 4.1.9.1.12.

4.1.9.1.8 (former 4.1.9.1.7) Amend to read as follows:

"4.1.9.1.8 Before each shipment of any package, it shall be ensured that all the requirements specified in the relevant provisions of this Code and in the applicable certificates of approval have been fulfilled. The following requirements shall also be fulfilled, if applicable:

.1 It shall be ensured that lifting attachments which do not meet the requirements of 6.4.2.2 have been removed or otherwise rendered incapable of being used for lifting the package, in accordance with 6.4.2.3;

.2 Each Type B(U), Type B(M) and Type C package shall be held until equilibrium conditions have been approached closely enough to demonstrate compliance with the requirements for temperature and pressure unless an exemption from these requirements has received unilateral approval;

.3 For each Type B(U), Type B(M) and Type C package, it shall be ensured by inspection and/or appropriate tests that all closures, valves and other openings of the containment system through which the radioactive contents might escape are properly closed and, where appropriate, sealed in the manner for which the demonstrations of compliance with the requirements of 6.4.8.8 and 6.4.10.3 were made;

.4 For packages containing fissile material the measurement specified in 6.4.11.5 (b) and the tests to demonstrate closure of each package as specified in 6.4.11.8 shall be performed."

4.1.9.2 Provisions and controls for transport of LSA material and SCO

4.1.9.2.2 Amend to read as follows:

"4.1.9.2.2 For LSA material and SCO which are or contain fissile material, which is not excepted under 2.7.2.3.5, the applicable requirements of 7.1.4.5.15 and 7.1.4.5.16 shall be met."

4.1.9.2.3 Insert a new paragraph 4.1.9.2.3 to read as follows:

"4.1.9.2.3 For LSA material and SCO which are or contain fissile material, the applicable requirements of 6.4.11.1 shall be met."

and current paragraphs 4.1.9.2.3 and 4.1.9.2.4 become new paragraphs 4.1.9.2.4 and 4.1.9.2.5 respectively. Table 4.1.9.2.4 is renumbered as 4.1.9.2.5.

4.1.9.2.4 (former 4.1.9.2.3) In .2, delete "and" at the end.

Add a new subparagraph .4 to read as follows:

".4 Unpackaged fissile material shall meet the requirements of 2.7.2.3.5.5"

4.1.9.2.5 (former 4.1.9.2.4) Replace "4.1.9.2.3" with "4.1.9.2.4" and "table 4.1.9.2.4" with "table 4.1.9.2.5".

Table 4.1.9.2.5 In note "a" under the table replace "4.1.9.2.3" with "4.1.9.2.4".

4.1.9.3 Packages containing fissile material

4.1.9.3 Amend to read as follows:

"4.1.9.3 The contents of packages containing fissile material shall be as specified for the package design either directly in the provisions of this Code or in the certificate of approval."

Chapter 4.2 – Use of portable tanks and multiple-element gas containers (MEGCs)

4.2.5 Portable tank instructions and special provisions

4.2.5.2.6 Portable tank instructions

4.2.5.2.6 Amend the header to the tabulated portable tank instructions for T1 – T22 to read as follows:

"These portable tank instructions apply to liquid and solid substances of Class 1 and Classes 3 to 9. The general provisions of section 4.2.1 and the requirements of section 6.7.2 shall be met."

4.2.5.2.6 In tank instruction T23, at the end of footnote § add: ""*CORROSIVE*" *subsidiary risk placard required (Model No 8, see 5.2.2.2.2).*"

4.2.5.3 Portable tank special provisions

4.2.5.3 In special provision TP32, paragraph (b), at the beginning, insert "For UN 3375 only,".

4.2.5.3 Add the following new portable tank special provision:

"TP41 The 2.5 year internal examination may be waived or substituted by other test methods or inspection procedures specified by the competent authority or its authorized body, provided that the portable tank is dedicated to the transport of the organometallic substances to which this tank special provision is assigned. However this examination is required when the conditions of 6.7.2.19.7 are met."

PART 5
CONSIGNMENT PROCEDURES

Chapter 5.1 – General provisions

5.1.2 Use of overpacks and unit loads

5.1.2.1 Add the following new sentence and note at the end:

"The lettering of the "OVERPACK" marking shall be at least 12 mm high.

Note: The size requirement for the "OVERPACK" marking shall apply as from 1 January 2016."

5.1.3 Empty uncleaned packagings or units

5.1.3.2 Replace "Packagings, including IBCs, and tanks" with "Freight containers, tanks, IBCs, as well as other packagings and overpacks,".

5.1.5 General provisions for class 7

5.1.5.1 Approval of shipments and notification

5.1.5.1.1 *General*

5.1.5.1.1 In the first sentence replace "for package designs" with "of package designs".

5.1.5.1.2 *Shipment approvals*

5.1.5.1.2 In subparagraph .4 replace "according to" with "in accordance with".

5.1.5.1.4 *Notifications*

5.1.5.1.4 In subparagraph .3 replace "for shipment approval" with "for approval of shipment (see 6.4.23.2)".

5.1.5.2 Certificates issued by competent authority

5.1.5.2.1 In .1, insert a new subparagraph .3 to read as follows:

".3 fissile material excepted under 2.7.2.3.5.6;".

and consequently, current subparagraphs .3 to .6 are renumbered as .4 to .7.

5.1.5.2.1 In subparagraph .5 (former .4) delete "all" and "replace "6.4.11.2" with "2.7.2.3.5, 6.4.11.2 or 6.4.11.3".

5.1.5.2.1 Insert new .4 and .5 to read as follows:

".4 Determination of the basic radionuclide values referred to in 2.7.2.2.1 for individual radionuclides which are not listed in table 2.7.2.2.1 (see 2.7.2.2.2 .1);

.5 Alternative activity limits for an exempt consignment of instruments or articles (see 2.7.2.2.2.2);.

5.1.5.2.1 Amend the second paragraph after subparagraphs .1 to .5 to read as follows:

"The certificates of approval for the package design and the shipment may be combined into a single certificate."

5.1.5.2.3 In the first sentence, amend the beginning of the sentence to read:

"For package designs where it is not required that a competent authority issue a certificate of approval, the consignor …"

5.1.5.3 Determination of transport index (TI) and criticality safety index (CSI)

5.1.5.3.4 In the first sentence, replace "and overpacks" with ", overpacks and freight containers".

In subparagraph .1, replace (twice) "or overpack" with ", overpack or freight container".

In subparagraph.5, insert "or freight container" after "overpack".

In the table in 5.1.5.3.4, replace "and overpacks" with ", overpacks and freight containers" and in note "b" to the table insert at end "except for freight containers (see table 7.1.4.5.3)".

5.1.5.3.5 Replace "design or shipment approval" with "approval of design or shipment".

5.1.5.4 Specific provisions for excepted packages

5.1.5.4 Amend the title to read "Specific provisions for excepted packages of radioactive material of Class 7".

5.1.5.4.1 After "excepted packages", insert "of radioactive material of Class 7".

5.1.5.4.2 Amend to read as follows:

"5.1.5.4.2 The documentation requirements of Chapter 5.4 do not apply to excepted packages of radioactive material of Class 7, except that:

.1 The UN number preceded by the letters "UN" and the name and address of the consignor and the consignee and, if relevant, the identification mark for each competent authority certificate of approval (see 5.4.1.5.7.1 7.) shall be shown on a transport document such as a bill of lading, air waybill or other similar document complying with the requirements of 5.4.1.2.1 to 5.4.1.2.4;

.2 The requirements of 5.4.1.6.2 and, if relevant, those of 5.4.1.5.7.1.7, 5.4.1.5.7.3 and 5.4.1.5.7.4 shall apply;

.3 The requirements of 5.4.2 and 5.4.4 shall apply."

5.1.5.4.3 Insert a new paragraph to read as follows:

"5.1.5.4.3 The requirements of 5.2.1.5.8 and 5.2.2.1.12.5 shall apply if relevant."

5.1.5.5 Specific provisions for the consignment of fissile material

Insert a new section 5.1.5.5 as follows:

"**5.1.5.5 Specific provisions for the consignment of fissile material**

Fissile material meeting one of the provisions of 2.7.2.3.5.1 to 2.7.2.3.5.6 shall meet the following requirements:

.1 Only one of the provisions of 2.7.2.3.5.1 to 2.7.2.3.5.6 is allowed per consignment;

.2 Only one approved fissile material in packages classified in accordance with 2.7.2.3.5.6 is allowed per consignment unless multiple materials are authorized in the certificate of approval;

.3 Fissile material in packages classified in accordance with 2.7.2.3.5.3 shall be transported in a consignment with no more than 45 g of fissile nuclides;

.4 Fissile material in packages classified in accordance with 2.7.2.3.5.4 shall be transported in a consignment with no more than 15 g of fissile nuclides;

.5 Unpackaged or packaged fissile material classified in accordance with 2.7.2.3.5.5 shall be transported under exclusive use on a conveyance with no more than 45 g of fissile nuclides."

Chapter 5.2 – Marking and labelling of packages including IBCs

5.2.1 Marking of packages including IBCs

5.2.1.1 Amend the second sentence to read as follows:

"The UN number and the letters "UN" shall be at least 12 mm high, except for packages of 30 litres capacity or less or of 30 kg maximum net mass and for cylinders of 60 litres water capacity when they shall be at least 6 mm in height and except for packages of 5 litres or 5 kg or less when they shall be of an appropriate size."

5.2.1.3 Add the following new sentence and note at the end:

"The lettering of the "SALVAGE" marking shall be at least 12 mm high.

NOTE: The size requirement for the "SALVAGE" marking shall apply as from 1 January 2016."

5.2.1.5 Special marking provisions for class 7

5.2.1.5 Replace "for Class 7" with "for radioactive material".

5.2.1.5.1 Insert the following sentence at the end:

"Each overpack shall be legibly and durably marked on the outside of the overpack with an identification of either the consignor or consignee, or both unless these markings of all packages within the overpack are clearly visible."

5.2.1.5.2 After "excepted packages" insert "of radioactive material of Class 7".

5.2.1.5.5 Amend the introductory sentence to read as follows:

"Each package which conforms to a design approved under one or more of paragraphs 5.1.5.2.1, 6.4.22.1 to 6.4.22.4, 6.4.23.4 to 6.4.23.7 and 6.4.24.2 shall be legibly and durably marked on the outside of the package with the following information:"

5.2.1.5.5 Amend .3 to read as follows:

".3 "Type B(U)", "Type B(M)" or "Type C", in the case of a Type B(U), Type B(M) or Type C package design"

5.2.1.5.5 Delete subparagraph 4.

5.2.1.5.7 Replace "4.1.9.2.3" with "4.1.9.2.4".

5.2.1.5.8 Replace "competent authority design or shipment approval" with "competent authority approval of design or shipment".

5.2.1.6 Special marking provisions for marine pollutants

5.2.1.6.1 Replace existing paragraph with the following:

"5.2.1.6.1 "Except as provided in 2.10.2.7, packages containing marine pollutants meeting the criteria of 2.9.3 shall be durably marked with the marine pollutant mark."

5.2.1.6.3 Amend 5.2.1.6.3 and figure to read as follows:

"5.2.1.6.3 The marine pollutant mark shall be as shown in the figure below.

Marine Pollutant Mark

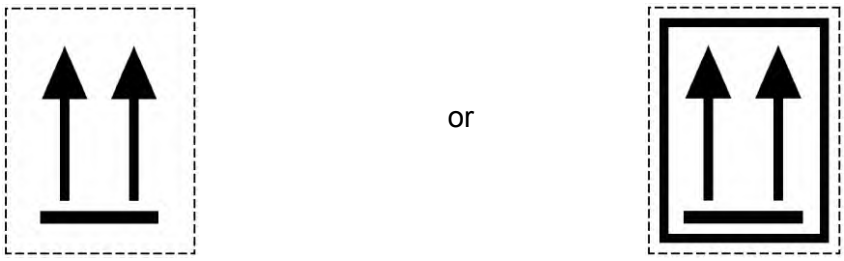
The marking shall be in the form of a square set at an angle of 45° (diamond-shaped). The symbol (fish and tree) shall be black on white or suitable contrasting background. The minimum dimensions shall be 100 mm x 100 mm and the minimum width of line forming the diamond shall be 2 mm. If the size of the package so requires, the dimensions/line thickness may be reduced, provided the marking remains clearly visible. Where dimensions are not specified, all features shall be in approximate proportion to those shown.

NOTE 1: The labelling provisions of 5.2.2 apply in addition to any requirement for packages to bear the marine pollutant mark.

NOTE 2: The provisions of 5.2.1.6.3 of IMDG Code (Amendment 36-12) may continue to be applied until 31 December 2016."

5.2.1.7 Amend the figures and caption below to read as follows:

"



Two black or red arrows on white or suitable contrasting background.
The rectangular border is optional
All features shall be in approximate proportion to those shown."

5.2.2 Labelling of packages including IBCs

5.2.2.1 Labelling provisions

5.2.2.1.12 Special provisions for the labelling of radioactive material

5.2.2.1.12.1 Amend the first and second sentences to read as follows:

> "Except when enlarged labels are used in accordance with 5.3.1.1.5.1, each package, overpack and freight container containing radioactive material shall bear the labels conforming to the applicable models Nos. 7A, 7B or 7C, according to the appropriate category. Labels shall be affixed to two opposite sides on the outside of the package or overpack or on the outside of all four sides of a freight container or tank."

5.2.2.1.12.1 In the fourth sentence amend "under 6.4.11.2" read "under the provisions of 2.7.2.3.5", replace "which conform to model" with "conforming to model"; replace the last phrase of the fourth sentence with the following:

> "such labels, where applicable shall be affixed adjacent to the labels conforming to the applicable model Nos. 7A, 7B or 7C."

5.2.2.1.12.2 In the introductory sentence, replace "Nos. 7A, 7B and 7C" with "the applicable model No. 7A, 7B or 7C".

5.2.2.1.12.2 In .2, amend the last sentence to read as follows:

> "For fissile material, the total mass of fissile nuclides in units of grams (g), or multiples thereof, may be used in place of activity".

5.2.2.1.12.3 Amend to read as follows:

> "5.2.2.1.12.3 Each label conforming to the model No. 7E shall be completed with the criticality safety index (CSI) as stated in the certificate of approval applicable in the countries through or into which the consignment is transported and issued by the competent authority or as specified in 6.4.11.2 or 6.4.11.3."

5.2.2.1.12.4 Amend to read as follows:

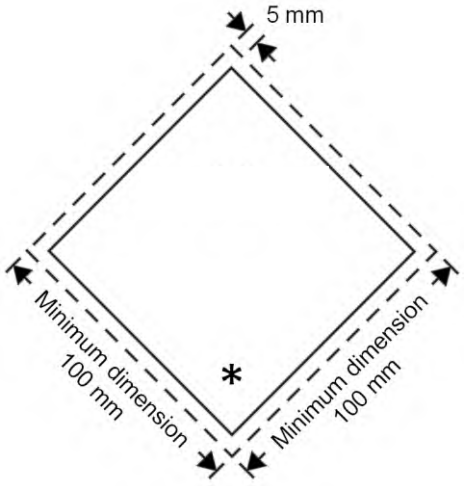
> "5.2.2.1.12.4 For overpacks and freight containers, the label conforming to model No. 7E shall bear the sum of the criticality safety indexes of all the packages contained therein".

5.2.2.1.12.5 Replace "competent authority design or shipment approval" with "competent authority approval of design or shipment".

5.2.2.2 Provisions for labels

5.2.2.2.1.1 Amend to read as follows:

> "5.2.2.2.1.1 Labels shall be configured as shown in the figure below:



Class/division label

* The class or, for divisions 5.1 and 5.2, the Division number shall be shown in the bottom corner

** Additional text/numbers/letters shall (if mandatory) or may (if optional) be shown in this bottom half

*** The class or division symbol or, for divisions 1.4, 1.5 and 1.6, the division number and for Model No 7E the word "FISSILE" shall be shown in this top half".

5.2.2.2.1.1.1 Labels shall be displayed on a background of contrasting colour, or shall have either a dotted or solid outer boundary line.

5.2.2.2.1.1.2 The label shall be in the form of a square set at an angle of 45° (diamond-shaped). The minimum dimensions shall be 100 mm x 100 mm and the minimum width of the line inside the edge forming the diamond shall be 2 mm. The line inside the edge shall be parallel and 5 mm from the outside of that line to the edge of the label. The line inside the edge on the upper half of the label shall be the same colour as the symbol and the line inside the edge on the lower half of the label shall be the same colour as the class or division number in the bottom corner. Where dimensions are not specified, all features shall be in approximate proportion to those shown.

5.2.2.2.1.1.3 If the size of the package so requires the dimensions may be reduced, provided the symbols and other elements of the label remain clearly visible. The line inside the edge shall remain 5 mm to the edge of the label. The minimum width of the line inside the edge shall remain 2 mm. Dimensions for cylinders shall comply with 5.2.2.2.1.2.

NOTE: The provisions of 5.2.2.2.1.1 of the IMDG Code (Amendment 36-12) may continue to be applied until 31 December 2016. When so applied, 5.2.2.2.1.1.1, 5.2.2.2.1.1.2 and 5.2.2.2.1.1.3 shall not apply until 31 December 2016."

5.2.2.2.2 Specimen Labels

5.2.2.2.2 Insert a new "note" under the heading as follows:

> **"Note:** 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."

The following symbols within the IMDG Code, should be replaced by those used by the UN Recommendations:

> Class 2.1, Class 2.3, No. 3, No. 4, Class 4.3, Class 5.1, Class 5.2, Class 6 and Class 8.

Chapter 5.3 – Placarding and marking of cargo transport units

5.3.1 Placarding

5.3.1.1 Placarding provisions

5.3.1.1.4 *Placarding requirements*

5.3.1.1.4.1 Replace the existing subparagraph ".1" with the following:

> ".1 a freight container, semi-trailer or portable tank: one on each side and one on each end of the unit. Portable tanks having a capacity of less than 3,000 litres may be placarded or, alternatively, may be labeled instead, on only two opposite sides."

5.3.1.1.5 *Special provisions for class 7*

5.3.1.1.5.1 Amend the last sentence to read as follows:

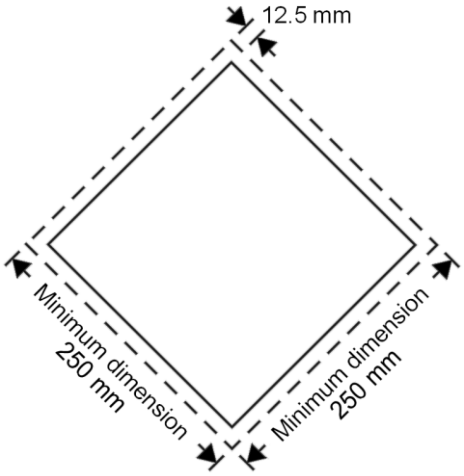
> "Instead of using both labels and placards, it is permitted as an alternative to use enlarged labels only, as shown in label models Nos. 7A, 7B and 7C, except having the minimum size shown in figure 5.3.1."

5.3.1.1.5.2 In the introductory sentence replace "No." with "Nos.", "or 7E" with "and 7E" and "(Model 7D)" with "(model No.7D)".

5.3.1.2 Specifications for placards

5.3.1.2.1 Amend to read as follows:

> "5.3.1.2.1 Except as provided in 5.3.1.2.2 for the Class 7 placard, and in 5.3.2.3.2 for the marine pollutant mark, a placard shall be configured as shown in the figure below.



Placard (except for class 7)

The placard shall be in the form of a square set at an angle of 45° (diamond-shaped). The minimum dimensions shall be 250 mm x 250 mm (to the edge of the placard). The line inside the edge shall be parallel and 12.5 mm from the outside of that line to the edge of the placard. The symbol and line inside the edge shall correspond in colour to the label for the class or division of the dangerous goods in question. The class or division symbol/numeral shall be positioned and sized in proportion to those prescribed in 5.2.2.2 for the corresponding class or division of the dangerous goods in question. The placard shall display the number of the class or division (and for goods in Class 1, the compatibility group letter) of the dangerous goods in question in the manner prescribed in 5.2.2.2 for the corresponding label, in digits not less than 25 mm high. Where dimensions are not specified, all features shall be in approximate proportion to those shown.

NOTE: The provisions of 5.3.1.2.1 from the IMDG Code (amendment 36-12) may continue to be applied until 31 December 2016."

5.3.2 Marking of cargo transport units

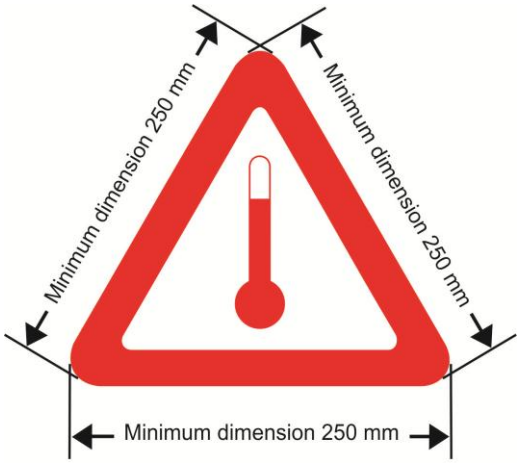
5.3.2.0.2 Insert a new second new sentence as follows:

"This may be reduced to 12 mm for portable tank containers with a capacity of less than 3,000 litres."

5.3.2.2 Elevated temperature substances

5.3.2.2.1 Amend to read as follows:

"5.3.2.2.1 Cargo transport units containing a substance that is transported or offered for transport in a liquid state at a temperature equal to or exceeding 100°C, in a solid state at a temperature equal to or exceeding 240°C shall bear on each side and on each end the mark shown in the figure below.



Mark for transport at elevated temperature

The marking shall be an equilateral triangle. The colour of the mark shall be red. The minimum dimension of the sides shall be 250 mm except for portable tanks with a capacity of less than 3,000 litres where the sides may be reduced to 100 mm. Where dimensions are not specified, all features shall be in approximate proportion to those shown.

Note: The provisions of 5.3.2.2 of the IMDG Code (Amendment 36-12) may continue to be applied until 31 December 2016."

5.3.2.3 Marine pollutant mark

5.3.2.3 Replace existing paragraph under 5.3.2.3 with the following:

"5.3.2.3.1 Except as provided in 2.10.2.7, cargo transport units containing marine pollutants shall clearly display the marine pollutant mark in locations indicated in 5.3.1.1.4.1"

5.3.2.3.2 The marine pollutant mark for cargo transport units shall be as described in 5.2.1.6.3, except that the minimum dimensions shall be 250 mm x 250 mm. For portable tanks with a capacity of less than 3,000 litres, the dimensions may be reduced to 100 mm x 100 mm."

Chapter 5.4 – Documentation

5.4.1 Dangerous goods transport information

5.4.1.4.3 Information which supplements the Proper Shipping Name in the dangerous goods description

5.4.1.4.3 Replace existing subparagraph ".5" with the following:

".5 Marine pollutants: Except as provided in 2.10.2.7, if the goods to be transported are marine pollutants, the goods shall be identified as "MARINE POLLUTANT", and for generic or "not otherwise specified" (N.O.S.) entries the Proper Shipping Name shall be supplemented with

the recognized chemical name of the marine pollutant (see 3.1.2.9). The term "MARINE POLLUTANT" may be supplemented with the term "ENVIRONMENTALLY HAZARDOUS";

5.4.1.5 Information required in addition to the dangerous goods description

5.4.1.5.7 *Radioactive material*

5.4.1.5.7.1 Amend subparagraph .6 to read as follows:

".6 For fissile material:

(i) Shipped under one exception of 2.7.2.3.5.1 to 2.7.2.3.5.6, reference to that paragraph;

(ii) Shipped under 2.7.2.3.5.1 to 2.7.2.3.5.5, the total mass of fissile nuclides;

(iii) Contained in a package for which one of 6.4.11.2 (a) to (c) or 6.4.11.3 is applied, reference to that paragraph;

(iv) The criticality safety index, where applicable."

5.4.1.5.7.1 In subparagraph .7, replace "competent authority approval certificate" with "competent authority certificate of approval" and insert "fissile material excepted under 2.7.2.3.5.6," before "special arrangement".

5.4.1.5.7.3 Replace "competent authorities design or shipment approval" with "competent authority approval of design or shipment".

5.4.1.6 Certification

5.4.1.6.1 In the text of the certification, after "above", insert "/ below*".

and insert the following footnote:

"* as appropriate".

5.4.1.5.12 Transport of solid dangerous goods in bulk containers

5.4.1.5.12 At the end replace the sentence "Bulk container BK2 approved by the competent authority of …" with the following:

"Bulk container BK(x) approved by the competent authority of …".

and at the end insert the following note:

Note: "(x)" shall be replaced with "1" or "2", as appropriate.

5.4.2 Container/vehicle packing certificate

5.4.2.1.8 Amend to read as follows:

".8 When substances presenting a risk of asphyxiation are used for cooling or conditioning purposes (such as dry ice (UN 1845) or nitrogen, refrigerated liquid (UN 1977) or argon, refrigerated liquid (UN 1951)), the container/vehicle is externally marked in accordance with 5.5.3.6; and".

5.4.3 Documentation required aboard the ship

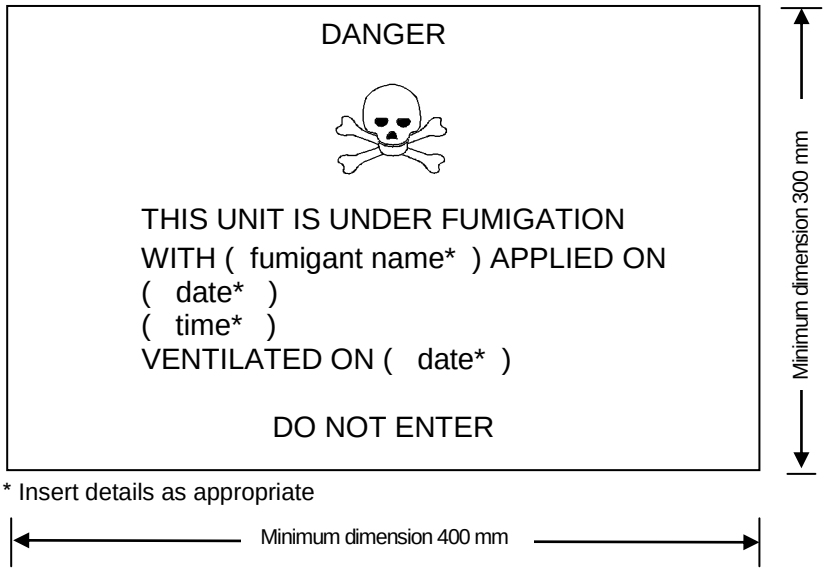
5.4.3.1 The footnote reference in the paragraph "* FAL.2/Circ.52/Rev.1 may be used for this purpose" is replaced with "Resolution FAL. 10(35), adopted on 16 January 2009, amendments to the annex to the convention on facilitation of international maritime traffic, 1965".

Chapter 5.5 – Special provisions

5.5.2.3 Marking and placarding

Amend 5.5.2.3.2 as follows:

"5.5.2.3.2 The fumigation warning mark shall be as shown in the figure below.



Fumigation warning mark

The marking shall be a rectangle. The minimum dimensions shall be 400 mm wide x 300 mm high and the minimum width of the outer line shall be 2 mm. The marking shall be in black print on a white background with lettering not less than 25 mm high. Where dimensions are not specified, all features shall be in approximate proportion to those shown.

Note: The provisions of 5.5.2.3.2 of the IMDG Code (Amendment 36-12) may continue to be applied until 31 December 2016."

5.5.3 Special provisions applicable to packages and cargo transport units containing substances presenting a risk of asphyxiation when used for cooling or conditioning purposes (such as dry ice (UN 1845) or nitrogen, refrigerated liquid (UN 1977) or argon, refrigerated liquid (UN 1951))

5.5.3.1 Scope

5.5.3 Add a new subparagraph 5.5.3.1.4 to read as follows:

"5.5.3.1.4 Cargo transport units containing substances used for cooling or conditioning purposes include cargo transport units containing substances used for cooling or conditioning purposes inside packages as well as cargo transport units with unpackaged substances used for cooling or conditioning purposes."

5.5.3.2 General

5.5.3.2.2 Amend the first sentence as follows:

"5.5.3.2.2 When dangerous goods are loaded in cargo transport units containing substances used for cooling or conditioning purposes any provisions of these Regulations relevant to these dangerous goods apply in addition to the provisions of this section."

5.5.3.2.4 Amend to read as follows:

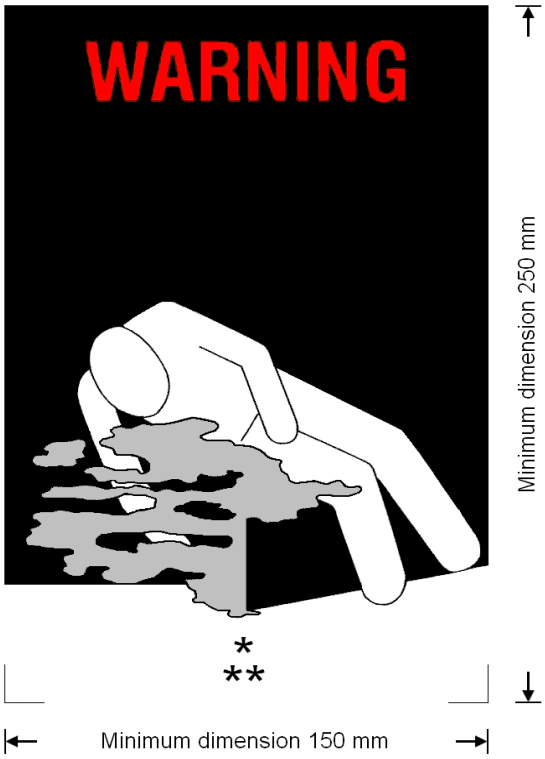
"5.5.3.2.4 Persons engaged in the handling or transport of cargo transport units containing substances used for cooling or conditioning purposes shall be trained commensurate with their responsibilities."

5.5.3.6 Marking of cargo transport units

5.5.3.6.1 Add "purposes" after "cooling or conditioning" in the first sentence.

5.5.3.6.2 Amend paragraph to read as follows:

"5.5.3.6.2 The warning mark shall be as shown in the figure below



Coolant/conditioning warning mark for cargo transport units

* Insert proper shipping name of the coolant/conditioner. The lettering shall be in capitals, all be on one line and shall be at least 25 mm high. If the length of the proper shipping name is too long to fit in the space provided, the lettering may be reduced to the maximum size possible to fit. For example: CARBON DIOXIDE, SOLID.

** Insert "AS COOLANT" or "AS CONDITIONER" as appropriate. The lettering shall be in capitals, all be on one line and be at least 25 mm high.

The marking shall be a rectangle. The minimum dimensions shall be 150 mm wide x 250 mm high. The word "WARNING" shall be in red or white and be at least 25 mm high. Where dimensions are not specified, all features shall be in approximate proportion to those shown.

NOTE: The provisions of 5.5.3.6.2 of the IMDG Code (Amendment 36-12) may continue to be applied until 31 December 2016."

5.5.3.7 Documentation

5.5.3.7.1 Replace "that have been cooled or conditioned" with "containing or have contained substances used for cooling or conditioning purposes".

PART 6
CONSTRUCTION AND TESTING OF PACKAGINGS, INTERMEDIATE BULK CONTAINERS (IBCs), LARGE PACKAGINGS, PORTABLE TANKS, MULTIPLE-ELEMENT GAS CONTAINERS (MEGCs) AND ROAD TANK VEHICLES

Chapter 6.1 – Provisions for the construction and testing of packagings (other than for class 6.2 substances)

6.1.1 Applicability and general provisions

6.1.1.1 Applicability

6.1.1.1.4 Amend to read "Packagings for liquids, other than combination packagings, with capacity exceeding 450 L".

6.1.3 Marking

6.1.3.1(e) Insert a reference to note "*" at the centre of the symbol and add the following note under the symbol:

> "* The last two digits of the year of manufacture may be displayed at that place. In such a case, the two digits of the year in the type approval marking and in the inner circle of the clock shall be identical."

and insert a new Note at the end to read as follows:

> "**NOTE**: Other methods that provide the minimum required information in a durable, visible and legible form are also acceptable."

Chapter 6.2 – Provisions for the construction and testing of pressure receptacles, aerosol dispensers, small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas

6.2.1 General provisions

6.2.1.1 Design and construction

6.2.1.1.5 Add the following new last sentence:

> "The test pressure of a cylinder for an adsorbed gas shall be in accordance with packing instruction P208."

6.2.2 Provisions for UN pressure receptacles

6.2.2 Add the following new second sentence:

> "Manufacture of new pressure receptacles or service equipment according to any particular standard in 6.2.2.1 and 6.2.2.3 is not permitted after the date shown in the right hand column of the tables."

Renumber the existing NOTE as "NOTE 1".

Add the following new note:

"**NOTE 2:** UN pressure receptacles and service equipment constructed according to standards applicable at the date of manufacture may continue in use subject to the periodic inspection provisions of this Code."

6.2.2.1 Design, construction and initial inspection and test

6.2.2.1.1 In the table, add a new third column. Add a new first row with the following text:

Reference	Title	Applicable for manufacture

For ISO Standards "ISO 9809-1:1999", "ISO 9809-2:2000"and "ISO 9809-3:2000", in the third column, add "Until 31 December 2018".

After ISO Standard "ISO 9809-1:1999" add the following new standard:

ISO 9809-1:2010	Gas cylinders -- Refillable seamless steel gas cylinders -- Design, construction and testing -- Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa	Until further notice

After ISO Standard "ISO 9809-2:2000" add the following new standard:

ISO 9809-2:2010	Gas cylinders – Refillable seamless steel gas cylinders – Design, construction and testing – Part 2: Quenched and tempered steel cylinders with tensile strength greater than or equal to 1 100 MPa	Until further notice

After ISO Standard "ISO 9809-3:2000" add the following new standard:

ISO 9809-3:2010	Gas cylinders -- Refillable seamless steel gas cylinders -- Design, construction and testing -- Part 3: Normalized steel cylinders	Until further notice

For all the other standards, in the column "Applicable for manufacture", add "Until further notice".

6.2.2.1.2 In the table, add a new third column. Add a new first row with the following text:

Reference	Title	Applicable for manufacture

For ISO Standard "ISO 11120:1999", in the column "Applicable for manufacture", add "Until further notice".

6.2.2.1.3 Amend the first table to read as follows:

Reference	Title	Applicable for manufacture
ISO 9809-1:1999	Gas cylinders – Refillable seamless steel gas cylinders – Design, construction and testing – Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa ***NOTE:*** *The note concerning the F factor in section 7.3 of this standard shall not be applied for UN cylinders.*	Until 31 December 2018
ISO 9809-1:2010	Gas cylinders – Refillable seamless steel gas cylinders – Design, construction and testing – Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa	Until further notice
ISO 9809-3:2000	Gas cylinders – Refillable seamless steel gas cylinders – Design, construction and testing – Part 3: Normalized steel cylinders	Until 31 December 2018
ISO 9809-3:2010	Gas cylinders – Refillable seamless steel gas cylinders – Design, construction and testing – Part 3: Normalized steel cylinders	Until further notice

6.2.2.1.3 (second table), 6.2.2.1.4 and 6.2.2.1.5 In the tables, add a new third column. Add a new first row with the following text:

Reference	Title	Applicable for manufacture

For all the standards, in the column "Applicable for manufacture", add "Until further notice".

6.2.2.1.6 After 6.2.2.1.5 insert the following new paragraphs:

"6.2.2.1.6 The standard shown below applies for the design, construction and initial inspection and test of UN bundles of cylinders. Each cylinder in a UN bundle of cylinders shall be a UN cylinder complying with the requirements of 6.2.2. The inspection requirements related to the conformity assessment system and approval for UN bundles of cylinders shall be in accordance with 6.2.2.5.

Reference	Title	Applicable for manufacture
ISO 10961:2010	Gas cylinders – Cylinder bundles – Design, manufacture, testing and inspection	Until further notice

NOTE: Changing one or more cylinders of the same design type, including the same test pressure, in an existing UN bundle of cylinders does not require re-certification of the existing bundle."

"6.2.2.1.7 The following standards apply for the design, construction and initial inspection and test of UN cylinders for adsorbed gases except that the inspection requirements related to the conformity assessment system and approval shall be in accordance with 6.2.2.5.

Reference	Title	Applicable for manufacture
ISO 11513:2011	Gas cylinders – Refillable welded steel cylinders containing materials for sub-atmospheric gas packaging (excluding acetylene) – Design, construction, testing, use and periodic inspection	Until further notice
ISO 9809-1:2010	Gas cylinders – Refillable seamless steel gas cylinders – Design, construction and testing – Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa	Until further notice

".

6.2.2.2 Materials

6.2.2.2 Replace "ISO 11114-1:1997" with "ISO 11114-1:2012". In the title for standard "ISO 11114-1:2012", delete "Transportable". Delete the note at the end.

6.2.2.3 Service equipment

6.2.2.3 Amend the first table to read as follows:

Reference	Title	Applicable for manufacture
ISO 11117:1998	Gas cylinders – Valve protection caps and valve guards for industrial and medical gas cylinders – Design, construction and tests	Until 31 December 2014
ISO 11117:2008 + Cor 1:2009	Gas cylinders − Valve protection caps and valve guards − Design, construction and tests	Until further notice
ISO 10297:1999	Gas cylinders – Refillable gas cylinder valves – Specification and type testing	Until 31 December 2008
ISO 10297:2006	Gas cylinders – Refillable gas cylinder valves – Specification and type testing	Until further notice
ISO 13340:2001	Transportable gas cylinders – Cylinders valves for non-refillable cylinders – Specification and prototype testing	Until further notice

6.2.2.3 In the second table, add a new third column. Add a new first row with the following text:

Reference	Title	Applicable for manufacture

For ISO Standard "ISO 16111:2008", in the column "Applicable for manufacture", add "Until further notice".

6.2.2.4 In the table, add a new third column. Add a new first row with the following text:

Reference	Title	Applicable

For all standards, in the column "Applicable", add "Until further notice".

6.2.2.4 Periodic inspection and test

6.2.2.4 In the table of standards for periodic inspection and test, after the entry for "ISO 10462:2005" add the following new entry:

ISO 11513:2011	Gas cylinders – Refillable welded steel cylinders containing materials for sub-atmospheric gas packaging (excluding acetylene) – Design, construction, testing, use and periodic inspection	Until further notice

6.2.2.7 Marking of refillable UN pressure receptacles

6.2.2.7 Amend the note to read as follows:

"**Note:** Marking requirements for UN metal hydride storage systems are given in 6.2.2.9 and marking requirements for UN bundles of cylinders are given in 6.2.2.10."

6.2.2.7.4 In subparagraph (p) replace "ISO 11114-1:1997" with "ISO 11114-1:2012".

6.2.2.7.9 Is deleted.

6.2.2.9 Marking of UN metal hydride storage systems

6.2.2.9.2 In subparagraph (j) replace "ISO 11114-1:1997" with "ISO 11114-1:2012".

6.2.2.10 Marking of bundles of cylinders

Add the following new section:

"**6.2.2.10 Marking of bundles of cylinders**

6.2.2.10.1 Individual cylinders in a bundle of cylinders shall be marked in accordance with 6.2.2.7.

6.2.2.10.2 Refillable UN bundles of cylinders shall be marked clearly and legibly with certification, operational, and manufacturing marks. These marks shall be permanently affixed (e.g. stamped, engraved, or etched) on a plate permanently attached to the frame of the bundle of cylinders. Except for the UN packaging symbol, the minimum size of the marks shall be 5 mm. The minimum size of the UN packaging symbol shall be 10 mm.

6.2.2.10.3 The following marks shall be applied:

(a) The certification marks specified in 6.2.2.7.2 (a), (b), (c), (d) and (e);

(b) The operational marks specified in 6.2.2.7.3 (f), (i), (j) and the total of the mass of the frame of the bundle and all permanently attached parts (cylinders, manifold, fittings and valves). Bundles intended for the carriage of UN 1001 acetylene, dissolved and UN 3374 acetylene, solvent free shall bear the tare mass as specified in clause B.4.2 of ISO 10961:2010; and

(c) The manufacturing marks specified in 6.2.2.7.4 (n), (o) and, where applicable, (p).

6.2.2.10.4 The marks shall be placed in three groups:

(a) The manufacturing marks shall be the top grouping and shall appear consecutively in the sequence given in 6.2.2.10.3 (c);

(b) The operational marks in 6.2.2.10.3 (b) shall be the middle grouping and the operational mark specified in 6.2.2.7.3 (f) shall be immediately preceded by the operational mark specified in 6.2.2.7.3 (i) when the latter is required;

(c) Certification marks shall be the bottom grouping and shall appear in the sequence given in 6.2.2.10.3 (a)."

6.2.4 Provisions for aerosol dispensers, small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas

6.2.4 In the heading, delete the word "flammable". Insert the following text after the heading:

"Each filled aerosol dispenser or gas cartridge or fuel cell cartridge shall be subjected to a test in a hot water bath in accordance with 6.2.4.1 or an approved water bath alternative in accordance with 6.2.4.2."

6.2.4.1 Small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas

Delete 6.2.4.1, 6.2.4.1.1 and 6.2.4.1.2, heading 6.2.4.2 and the text under this heading.

Renumber heading 6.2.4.2.1 as 6.2.4.1.

6.2.4.2 Aerosol dispensers

6.2.4.2.1 *Hot water bath test*

6.2.4.2.1.1 Renumber as 6.2.4.1.1. In the first sentence, after "capacity of the aerosol dispenser" insert ", gas cartridge or fuel cell cartridge". In the second sentence, after "to heat or if aerosol dispensers" insert "gas cartridges or fuel cell cartridges" and after "one aerosol dispenser," insert "gas cartridge or fuel cell cartridge".

6.2.4.2.1.2 Renumber as 6.2.4.1.2. After the first "aerosol dispenser" insert ", receptacle or fuel cell cartridge". After the second "aerosol dispenser" insert ", gas cartridge or fuel cell cartridge".

Renumber heading 6.2.4.2.2 as 6.2.4.2 and, in the text under this heading, replace "of 6.2.4.2.2.1, 6.2.4.2.2.2 and 6.2.4.2.2.3" by "of 6.2.4.2.1 and, as appropriate, 6.2.4.2.2 or 6.2.4.2.3".

6.2.4.2.2 *Alternative methods*

6.2.4.2.2.1 Renumber as 6.2.4.2.1. In the first sentence, after "Aerosol dispenser" insert ", gas cartridge or fuel cell cartridge". In the second sentence, after "that all aerosol dispensers" insert ", gas cartridges or fuel cell cartridges" In indent (f) insert the following text at the end ", gas cartridges or fuel cell cartridges".

Before 6.2.4.2.2.2, insert the following text "6.2.4.2.2 Aerosol dispensers".

6.2.4.2.2.2 *Pressure and leak testing of aerosol dispensers before filling*

6.2.4.2.2.2 Renumber as 6.2.4.2.2.1. Replace "Every" with "Each" at the beginning of the first sentence.

6.2.4.2.2.3 *Testing of the aerosol dispensers after filling*

6.2.4.2.2.3 Renumber as 6.2.4.2.2.2.

Add a new 6.2.4.2.3 to read as follows:

"6.2.4.2.3 Gas cartridges and fuel cell cartridges

6.2.4.2.3.1 Pressure testing of gas cartridges and fuel cell cartridges

Each gas cartridge or fuel cell cartridge shall be subjected to a test pressure equal to or in excess of the maximum expected in the filled receptacle at 55°C (50°C if the liquid phase does not exceed 95% of the capacity of the receptacle at 50°C). This test pressure shall be that specified for the gas cartridge or fuel cell cartridge and shall not be less than two thirds the design pressure of the gas cartridge or fuel cell cartridge. If any gas cartridge or fuel cell cartridge shows evidence of leakage at a rate equal to or greater than 3.3×10^{-2} mbar.l.s^{-1} at the test pressure or distortion or any other defect, it shall be rejected.

6.2.4.2.3.2 Leak testing gas cartridges and fuel cell cartridges

Prior to filling and sealing, the filler shall ensure that the closures (if any), and the associated sealing equipment are closed appropriately and the specified gas is used.

Each filled gas cartridge or fuel cell cartridge shall be checked for the correct mass of gas and shall be leak tested. The leak detection equipment shall be sufficiently sensitive to detect at least a leak rate of 2.0×10^{-3} mbar.l.s^{-1} at 20°C.

Any gas cartridge or fuel cell cartridge that has gas masses not in conformity with the declared mass limits or shows evidence of leakage or deformation, shall be rejected."

Chapter 6.4 – Provisions for the construction, testing and approval of packages and material of class 7

In the title, replace "class 7" with "radioactive material".

6.4.2 General provisions

6.4.2.11 Insert a new paragraph 6.4.2.11 to read as follows:

"6.4.2.11 A package shall be so designed that it provides sufficient shielding to ensure that, under routine conditions of transport and with the maximum radioactive contents that the package is designed to contain, the radiation level at any point on the external surface of the package would not exceed the values specified in 2.7.2.4.1.2, 4.1.9.1.10 and 4.1.9.1.11, as applicable, with account taken of 7.1.4.5.3.3 and 7.1.4.5.5".

Current paragraphs 6.4.2.11 and 6.4.2.12 become 6.4.2.12 and 6.4.2.13 respectively.

6.4.3 Additional provisions for packages transported by air

6.4.3.3 Replace "leakage" with "loss or dispersal of radioactive contents from the containment system,".

6.4.6 Provisions for packages containing uranium hexafluoride

6.4.6.1 Amend the first sentence to read as follows:

"Packages designed to contain uranium hexafluoride shall meet the requirements which pertain to the radioactive and fissile properties of the material prescribed elsewhere in this Code."

6.4.6.2 In subparagraphs .1 and .3, insert at the end: "except as allowed in 6.4.6.4".

6.4.6.4 In the introductory sentence replace "the approval of the competent authority" with "multilateral approval" and insert "the packages are designed:" at the end, after "if".

and in subparagraphs (a) and (b) delete "the packages are designed" and replace "and" with "and/or" at the end. In subparagraph (c), delete "for packaged designed" and replace "hexafluoride, the packages" with "hexafluoride and the packages".

6.4.8 Provisions for Type B(U) packages

6.4.8.1 Amend to read as follows:

"6.4.8.1 Type B(U) packages shall be designed to meet the requirements specified in 6.4.2, the requirements specified in 6.4.3 if carried by air, and of 6.4.7.2 to 6.4.7.15, except as specified in 6.4.7.14 (a), and, in addition, the requirements specified in 6.4.8.2 to 6.4.8.15."

6.4.8.2 Amend the end of the introductory paragraph to read: "…which may cause one or more of the following:". And in (a) and (b), delete "or" at the end.

6.4.8.8 In subparagraph (b), replace "and the tests in" with "and either the test in."

6.4.9 Provisions for Type B(M) packages

6.4.9.1 In the first sentence, replace "6.4.8.4, 6.4.8.5 and 6.4.8.6," with "6.4.8.4 to 6.4.8.6". And in the second sentence, insert "6.4.8.4 and" after "packages specified in".

6.4.10 Provisions for Type C packages

6.4.10.3 Amend to read as follows:

"6.4.10.3 A package shall be so designed that, if it were at the maximum normal operating pressure and subjected to:

(a) The tests specified in 6.4.15, it would restrict the loss of radioactive contents to not more than 10^{-6} A_2 per hour; and

(b) The test sequences in 6.4.20.1,

(i) it would retain sufficient shielding to ensure that the radiation level at 1 m from the surface of the package would not exceed 10 mSv/h with the maximum radioactive contents which the package is designed to contain; and

(ii) it would restrict the accumulated loss of radioactive contents in a period of 1 week to not more than 10 A_2 for krypton-85 and not more than A_2 for all other radionuclides."

The text of last paragraph remains unchanged.

6.4.11 Provisions for packages containing fissile material

6.4.11.1 In (a), insert "routine," before "normal".

6.4.11.1 Amend (b)(i) to read as follows: "of 6.4.7.2 except for unpackaged material when specifically allowed by 2.7.2.3.5.5;".

6.4.11.1 In (b)(ii) delete "and" at the end.

6.4.11.1 Amend (b)(iii) to read as follows: "of 6.4.7.3 unless the material is excepted by 2.7.2.3.5;".

6.4.11.1 Insert a new (b) (iv) to read as follows:

"(iv) of 6.4.11.4 to 6.4.11.14, unless the material is excepted by 2.7.2.3.5, 6.4.11.2 or 6.4.11.3."

6.4.11.2 Amend to read as follows:

"6.4.11.2 Packages containing fissile material that meet the provisions of subparagraph (d) and one of the provisions of (a) to (c) below are excepted from the requirements of 6.4.11.4 to 6.4.11.14.

(a) Packages containing fissile material in any form provided that:

(i) The smallest external dimension of the package is not less than 10 cm;

(ii) The criticality safety index of the package is calculated using the following formula:

$$CSI = 50 \times 5 \times \left(\frac{Mass \text{ of U-235 in package (g)}}{Z} + \frac{Mass \text{ of other fissile nuclides * in package (g)}}{280} \right)$$

* Plutonium may be of any isotopic composition provided that the amount of Pu-241 is less than that of Pu-240 in the package

where the values of Z are taken from table 6.4.11.2.

(iii) The CSI of any package does not exceed 10;

(b) Packages containing fissile material in any form provided that:

(i) The smallest external dimension of the package is not less than 30 cm;

(ii) The package, after being subjected to the tests specified in 6.4.15.1 to 6.4.15.6;

- Retains its fissile material contents;
- Preserves the minimum overall outside dimensions of the package to at least 30 cm;
- Prevents the entry of a 10 cm cube.

(iii) The criticality safety index of the package is calculated using the following formula:

$$CSI = 50 \times 2 \times \left(\frac{Mass \text{ of U-235 in package (g)}}{Z} + \frac{Mass \text{ of other fissile nuclides * in package (g)}}{280} \right)$$

* Plutonium may be of any isotopic composition provided that the amount of Pu-241 is less than that of Pu-240 in the package.

where the values of Z are taken from table 6.4.11.2.

(iv) The criticality safety index of any package does not exceed 10;

(c) Packages containing fissile material in any form provided that:

(i) The smallest external dimension of the package is not less than 10 cm;

(ii) The package, after being subjected to the tests specified in 6.4.15.1 to 6.4.15.6;

- Retains its fissile material contents;
- Preserves the minimum overall outside dimensions of the package to at least 10 cm;
- Prevents the entry of a 10 cm cube.

(iii) The CSI of the package is calculated using the following formula:

$$CSI = 50 \times 2 \times \left(\frac{Mass \text{ of U-235 in package (g)}}{450} + \frac{Mass \text{ of other fissile nuclides * in package (g)}}{280} \right)$$

* Plutonium may be of any isotopic composition provided that the amount of Pu-241 is less than that of Pu-240 in the package.

(iv) The maximum mass of fissile nuclides in any package does not exceed 15 g;

(d) The total mass of beryllium, hydrogenous material enriched in deuterium, graphite and other allotropic forms of carbon in an individual package shall not be greater than the mass of fissile nuclides in the package except where their total concentration does not exceed 1 g in any 1,000 g of material. Beryllium incorporated in copper alloys up to 4% in weight of the alloy does not need to be considered."

Table 6.4.11.2 Insert a new table 6.4.11.2 to read as follows:

"Table 6.4.11.2 Values of Z for calculation of criticality safety index in accordance with 6.4.11.2

Enrichement[a]	*Z*
Uranium enriched up to 1.5%	2200
Uranium enriched up to 5%	850
Uranium enriched up to 10%	660
Uranium enriched up to 20%	580
Uranium enriched up to 100%	450

[a] *If a package contains uranium with varying enrichments of U-235, then the value corresponding to the highest enrichment shall be used for Z.*

"

6.4.11.3 Insert a new paragraph 6.4.11.3 to read as follows:

"6.4.11.3 Packages containing not more than 1 000 g of plutonium are excepted from the application of 6.4.11.4 to 6.4.11.14 provided that:

(a) Not more than 20% of the plutonium by mass is fissile nuclides;

(b) The criticality safety index of the package is calculated using the following formula:

$$CSI = 50 \times 2 \times \frac{\text{mass of plutonium (g)}}{1000}$$

(c) If uranium is present with the plutonium, the mass of uranium shall be no more than 1% of the mass of the plutonium."

Current paragraphs 6.4.11.3 to 6.4.11.13 become new paragraphs 6.4.11.4 to 6.4.11.14.

6.4.11.4 (former 6.4.11.3) Replace "6.4.11.7 to 6.4.11.12" with "6.4.11.8 to 6.4.11.13".

6.4.11.5 (former 6.4.11.4) Replace "6.4.11.7 to 6.4.11.12" with "6.4.11.8 to 6.4.11.13" and insert "either" at the end of the introductory sentence.

6.4.11.8 (former 6.4.11.7), in the last sentence of the introductory paragraph, insert "either of" before "the following:" and in subparagraph (a) and (b) (i), replace "6.4.11.12 (b)" with "6.4.11.13 (b)".

6.4.11.9 (former 6.4.11.8), in the last sentence replace "6.4.11.12 (b)" with "6.4.11.13 (b)" and "6.4.11.9 (c)" with "6.4.11.10 (c)".

6.4.11.10 (former 6.4.11.9) In the introductory sentence replace "6.4.11.7 and 6.4.11.8" with "6.4.11.8 and 6.4.11.9".

6.4.11.10 (former 6.4.11.9) In subparagraph (b), replace "6.4.11.11 (b)" with "6.4.11.12 (b)". In (c), replace "6.4.11.12 (b)" with "6.4.11.13 (b)".

6.4.11.11 (former 6.4.11.10) In subparagraph (b), replace "6.4.11.9" with "6.4.11.10" and "6.4.11.7" with "6.4.11.8".

6.4.11.13 (former 6.4.11.12) In subparagraph (c), replace "6.4.11.12 (b)" with "6.4.11.13(b)".

6.4.11.14 (former 6.4.11.13) Replace "6.4.11.11 and 6.4.11.12" with "6.4.11.12 and 6.4.11.13".

6.4.13 Testing the integrity of the containment system and shielding and evaluating criticality safety

6.4.13 In subparagraph (c) replace "6.4.11.13" with "6.4.11.14".

6.4.15 Test for demonstrating ability to withstand normal conditions of transport

6.4.15.5 In subparagraph (a), amend the beginning to read: "The equivalent of 5 times …".

6.4.17 Tests for demonstrating ability to withstand accident conditions of transport

6.4.17.2 In the introductory paragraph, replace "6.4.11.12" with "6.4.11.13".

6.4.17.2 In subparagraph (b), move the phrase "so as to suffer maximum damage" to the end of the sentence after "on the target".

6.4.17.2 In subparagraph (c), insert the following new third sentence: "The lower face of the steel plate shall have its edges and corners rounded off to a radius of not more than 6 mm."

6.4.19 Water leakage test for packages containing fissile material

6.4.19.1 Replace "6.4.11.7 to 6.4.11.12" with "6.4.11.8 to 6.4.11.13".

6.4.19.2 Replace "6.4.11.12" with "6.4.11.13".

6.4.20 Tests for Type C packages

6.4.20.2 In the first sentence, insert "vertical" before "solid". In the second sentence replace "the probe to the surface of the specimen shall be as to cause" with "the package specimen and the impact point on the package surface shall be such as to cause".

6.4.22 Approvals of package designs and materials

6.4.22.4 Amend to read as follows:

"6.4.22.4 Each package design for fissile material which is not excepted by any of the paragraphs 2.7.2.3.5.1 to 2.7.2.3.5.6, 6.4.11.2 and 6.4.11.3 shall require multilateral approval."

6.4.22.6 Insert a new paragraph 6.4.22.6 to read as follows:

"6.4.22.6 The design for a fissile material excepted from "FISSILE" classification in accordance with 2.7.2.3.5.6 shall require multilateral approval.

6.4.22.7 Insert a new paragraph to read as follows:

"6.4.22.7 Alternative activity limits for an exempt consignment of instruments or articles in accordance with 2.7.2.2.2.2 shall require multilateral approval."

6.4.23 Applications for approval and approvals for radioactive material transport

6.4.23.2 In the introductory sentence replace "shipment approval" with "approval of shipment".

In subparagraph .3, amend the end of the paragraph to read as follows:

"… referred to in the certificate of approval for the package design, if applicable, issued under 5.1.5.2.1.1.3, 5.1.5.2.1.1.6 or 5.1.5.2.1.1.7, are to be put into effect.".

6.4.23.4 In (f), insert "nuclear" after "irradiated" and replace "6.4.11.4 (b)" with "6.4.11.5 (b)". In (i), replace "quality assurance programme" with "management system" and "1.1.2.3.1" with "1.5.3.1".

6.4.23.5 In the introductory sentence, delete "for package approval".

in subparagraph (a), replace "6.4.8.4, 6.4.8.5, 6.4.8.6" with "6.4.8.4 to 6.4.8.6".

and in subparagraph (d), amend the beginning of the sentence to read: "a statement of the range".

6.4.23.6 Replace "quality assurance programme" with "management system".

6.4.23.7 Replace "quality assurance programme" with "management system".

6.4.23.8 In subparagraph (d) replace "quality assurance programme" with "management system".

6.4.23.9 Insert a new paragraph to read as follows:

"6.4.23.9 An application for approval of design for fissile material excepted from "FISSILE" classification in accordance with table 2.7.2.1.1, under 2.7.2.3.5.6 shall include:

(a) A detailed description of the material; particular reference shall be made to both physical and chemical states;

(b) A statement of the tests that have been carried out and their results, or evidence based on calculation methods to show that the material is capable of meeting the requirements specified in 2.7.2.3.6;

(c) A specification of the applicable management system as required in 1.5.3.1;

(d) A statement of specific actions to be taken prior to shipment."

6.4.23.10 Insert a new paragraph to read as follows:

"6.4.23.10 An application for approval of alternative activity limits for an exempt consignment of instruments or articles shall include:

(a) An identification and detailed description of the instrument or article, its intended uses and the radionuclide(s) incorporated;

(b) The maximum activity of the radionuclide(s) in the instrument or article;

(c) Maximum external radiation levels arising from the instrument or article;

(d) The chemical and physical forms of the radionuclide(s) contained in the instrument or article;

(e) Details of the construction and design of the instrument or article, particularly as related to the containment and shielding of the radionuclide in routine, normal and accident conditions of transport;

(f) The applicable management system, including the quality testing and verification procedures to be applied to radioactive sources, components and finished products to ensure that the maximum specified activity of radioactive material or the maximum radiation levels specified for the instrument or article are not exceeded, and that the instruments or articles are constructed according to the design specifications;

(g) The maximum number of instruments or articles expected to be shipped per consignment and annually;

(h) Dose assessments in accordance with the principles and methodologies set out in the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, Safety Series No.115, IAEA, Vienna (1996), including individual doses to transport workers and members of the public and, if appropriate, collective doses arising from routine, normal and accident conditions of transport, based on representative transport scenarios the consignments are subject to."

Current paragraphs 6.4.23.9 to 6.4.23.11 become new paragraphs 6.4.23.11 to 6.4.23.13.

6.4.23.11 (former 6.4.23.9), in the introductory sentence, replace "approval certificate" with "certificate of approval".

6.4.23.11 (former 6.4.23.9) (a), replace "6.4.23.10 (b)" with "6.4.23.12 (b).

6.4.23.11 (former 6.4.23.9) (b) Insert "or alternative activity limit for exempt consignment" at the end of the first sentence. Amend the second sentence to read: "The identification mark of the approval of shipment shall be clearly related to the identification mark of the approval of design."

6.4.23.11 (former 6.4.23.9) (c) In the introductory sentence, replace "types of approval certificates" with "types of certificate of approval". Insert the following line between those corresponding to LD and T: "FE Fissile material complying with the requirements of 2.7.2.3.6". Add the following line at the end of the list: "AL Alternative activity limits for an exempt consignment of instruments or articles".

6.4.23.11 (former 6.4.23.9) (d) Insert "certificates of approval of" before "package design", delete (twice) "approval certificates" after "radioactive material", and replace "6.4.24.2 to 6.4.24.4" with "6.4.24.2 to 6.4.24.5".

6.4.23.12 (former 6.4.23.10) In the introductory sentence replace "type codes" with "identification marks".

6.4.23.12 (former 6.4.23.10) (a) Replace "6.4.23.9 (a), (b), (c) and (d)" with "6.4.23.11 (a), (b), (c) and (d)"; "design approval" with "approval of design", and "shipment approval" with "the approval of shipment".

6.4.23.12 (former 6.4.23.10) (a) For A/132/B(M)F-96, replace "package design approval certificate" with "certificate of approval for the package design".

6.4.23.12 (former 6.4.23.10) (a) For A/132/B(M)F-96T, replace "shipment approval" with "approval of shipment".

6.4.23.12 (former 6.4.23.10) (a) For A/137/X, replace "a special arrangement approval" with "an approval of special arrangement".

6.4.23.12 (former 6.4.23.10) (a) For A/139/IF-96 and A/145/H(U)-96, replace "package design approval certificate" with "certificate of approval for the package design".

6.4.23.12 (former 6.4.23.10) (b) Replace "according to 6.4.23.16" with "in accordance with 6.4.23.20".

6.4.23.12 (former 6.4.23.10) (c) Replace (twice) "package design approval certificate" with "certificate of approval for the package design"; and "approval certificate" with "certificate of approval" in the last sentence.

6.4.23.13 (former 6.4.23.11) In the introductory sentence replace "approval certificate" with "certificate of approval" and in (i) replace "quality assurance programme" with "management system".

6.4.23.14 Insert a new paragraph to read as follows:

"6.4.23.14 Each certificate of approval issued by a competent authority for material excepted from classification as "FISSILE" shall include the following information:

(a) Type of certificate;

(b) The competent authority identification mark;

(c) The issue date and an expiry date;

(d) List of applicable national and international regulations, including the edition of the IAEA Regulations for the Safe Transport of Radioactive Material under which the exception is approved;

(e) A description of the excepted material;

(f) Limiting specifications for the excepted material;

(g) A specification of the applicable management system as required in 1.5.3.1;

(h) Reference to information provided by the applicant relating to specific actions to be taken prior to shipment;

(i) If deemed appropriate by the competent authority, reference to the identity of the applicant;

(j) Signature and identification of the certifying official;

(k) Reference to documentation that demonstrates compliance with 2.7.2.3.6."

Current paragraphs 6.4.23.12 to 6.4.23.14 become new paragraphs 6.4.23.15 to 6.4.23.17.

6.4.23.15 (former 6.4.23.12), in the introductory sentence replace "approval certificate" with "certificate of approval".

6.4.23.15 (former 6.4.23.12) (j), replace "amounts" with "mass" and amend the end of the paragraph to read as follows: "… special form radioactive material, low dispersible radioactive material or fissile material excepted under 2.7.2.3.5.6 if applicable;".

6.4.23.15 (former 6.4.23.12) (k)(v), replace "6.4.11.4 (b)" with "6.4.11.5(b)".

6.4.23.15 (former 6.4.23.12) (r), replace "quality assurance programme" with "management system".

6.4.23.16 (former 6.4.23.13), in the introductory sentence, replace "approval certificate" with "certificate of approval".

6.4.23.16 (former 6.4.23.13) (i), replace "design approval certificate(s)" with "certificate(s) of approval of design".

6.4.23.16 (former 6.4.23.13) (g), replace "amounts" with "mass" and amend the end of the paragraph to read as follows: "…special form radioactive material, low dispersible radioactive material or fissile material excepted under 2.7.2.3.5.6 if applicable;".

6.4.23.16 (former 6.4.23.13) (l), replace "quality assurance programme" with "management system".

6.4.23.17 (former 6.4.23.14), in the introductory sentence, replace "approval certificate" with "certificate of approval".

6.4.23.17 (former 6.4.23.14) (h), replace "shipment approval" with "approval of shipment".

6.4.23.17 (former 6.4.23.14) (l), amend the end of the second sentence to read as follows: "… mass in grams (for fissile material the total mass of fissile nuclides or the mass for each fissile nuclide, when appropriate) and whether special form radioactive material, low dispersible radioactive material or fissile material excepted under 2.7.2.3.5.6, if applicable;".

6.4.23.17 (former 6.4.23.14) (n), amend the introductory sentence to read as follows: "For package designs containing fissile material which require multilateral approval of the package design in accordance with 6.4.22.4:".

6.4.23.17 (former 6.4.23.14) (n)(vi), replace "6.4.11.4 (b)" with "6.4.11.5 (b)".

6.4.23.17 (former 6.4.23.14) (t), replace "quality assurance programme" with "management system".

6.4.23.18 Insert a new paragraph 6.4.23.18 to read as follows:

"6.4.23.18 Each certificate issued by a competent authority for alternative activity limits for an exempt consignment of instruments or articles according to 5.1.5.2.1.4 shall include the following information:

(a) Type of certificate;

(b) The competent authority identification mark;

(c) The issue date and an expiry date;

(d) List of applicable national and international regulations, including the edition of the IAEA Regulations for the Safe Transport of Radioactive Material under which the exemption is approved;

(e) The identification of the instrument or article;

(f) A description of the instrument or article;

(g) Design specifications for the instrument or article;

(h) A specification of the radionuclide(s), the approved alternative activity limit(s) for the exempt consignment(s) of the instrument(s) or article(s);

(i) Reference to documentation that demonstrates compliance with 2.7.2.2.2.2;

(j) If deemed appropriate by the competent authority, reference to the identity of the applicant;

(k) Signature and identification of the certifying official."

Current paragraphs 6.4.23.15 and 6.4.23.16 become 6.4.23.19 and 6.4.23.20 respectively.

6.4.24 Transitional measures for class 7

6.4.24.1 Amend to read as follows:

"Packages not requiring competent authority approval of design (excepted packages, Type IP-1, Type IP-2, Type IP-3 and Type A packages) shall meet these Regulations in full, except that packages that meet the requirements of the 1985 or 1985 (as amended 1990) Editions of IAEA Regulations for the Safe Transport of Radioactive Material (IAEA Safety Series No.6):

(a) May continue in transport provided that they were prepared for transport prior to 31 December 2003, and subject to the requirements of 6.4.24.4, if applicable;

(b) May continue to be used provided that:

(i) They were not designed to contain uranium hexafluoride;

(ii) The applicable requirements of 1.5.3.1 of this Code are applied;

(iii) The activity limits and classification in Chapter 2.7 of these Regulations are applied;

(iv) The requirements and controls for transport in Parts 1, 3, 4, 5 and 7 of this Code are applied;

(v) The packaging was not manufactured or modified after 31 December 2003."

6.4.24.2 Amend to read as follows:

"6.4.24.2 Packages requiring competent authority approval of the design shall meet the provisions of this Code in full unless the following conditions are met:

(a) The packagings were manufactured to a package design approved by the competent authority under the provisions of the 1973 or 1973 (as amended) or the 1985 or 1985 (as amended 1990) Editions of IAEA Safety Series No.6);

(b) The package design is subject to multilateral approval;

(c) The applicable requirements of 1.5.3.1 of this Code are applied;

(d) The activity limits and classification in Chapter 2.7 of this Code are applied;

(e) The requirements and controls for transport in in Parts 1, 3, 4, 5 and 7 of this Code are applied;

(f) For a package containing fissile material and transported by air, the requirement of 6.4.11.11 is met;

(g) For packages that meet the requirements of the 1973 or 1973 (as amended) Editions of IAEA Safety Series No. 6:

(i) The packages retain sufficient shielding to ensure that the radiation level at 1 m from the surface of the package would not exceed 10 mSv/h in the accident conditions of transport defined in the 1973 Revised or 1973 Revised (as amended) Editions of IAEA Safety Series No.6 with the maximum radioactive contents which the package is authorized to contain;

(ii) The packages do not utilize continuous venting;

(iii) A serial number in accordance with the provision of 5.2.1.5.5 is assigned to and marked on the outside of each packaging."

6.4.24.3 Amend to read as follows:

"No new manufacture of packagings to a package design meeting the provisions of the 1973, 1973 (as amended), 1985, and 1985 (as amended 1990) Editions of IAEA Safety Series No.6 shall be permitted to commence."

6.4.24.4 Insert a new paragraph to read as follows:

"6.4.24.4 Packages excepted from the requirements for fissile materials under the Regulations annexed to the 16th revised edition or the seventeenth revised edition of the United Nations Recommendations on the Transport of Dangerous Goods (2009 Edition of IAEA Safety Standard Series No.TS-R-1)

6.4.24.4 Packages containing fissile material that is excepted from classification as "FISSILE" according to 2.7.2.3.5.1 (i) or (iii) of the IMDG Code amendment 35-10) or amendment 36-12, (paragraphs 417 (a) (i) or (iii) of the 2009 Edition of IAEA Regulations for the Safe Transport of Radioactive Material) prepared for transport before 31 December 2014 may continue in transport and may continue to be classified as non-fissile or fissile-excepted except that the consignment limits in table 2.7.2.3.5 of these editions shall apply to the conveyance. The consignment shall be transported under exclusive use."

and current paragraph 6.4.24.4 becomes new 6.4.24.5.

6.4.24.5 (former 6.4.24.4) In the first sentence, replace "programme of quality assurance" with "management system". Replace the last sentence with the following: "No new manufacture of such special form radioactive material shall be permitted to commence."

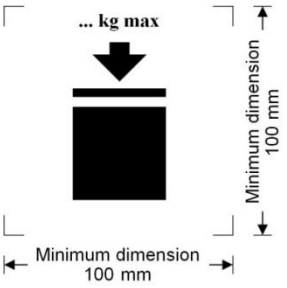
Chapter 6.5 – Provisions for the construction and testing of intermediate bulk containers (IBCs)

6.5.2 Marking

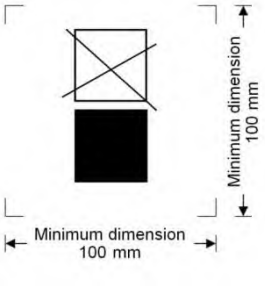
6.5.2.2 Additional marking

Amend 6.5.2.2.2 to read as follows:

"6.5.2.2.2 The maximum permitted stacking load applicable when the IBC is in use shall be displayed on a symbol as shown in the figures below. The symbol shall be durable and clearly visible.



IBCs capable of being stacked



IBCs NOT capable of being stacked

The minimum dimensions shall be 100 mm x 100 mm. The letters and numbers indicating the mass shall be at least 12 mm high. The area within the printer's marks indicated by the dimensional arrows shall be square. Where dimensions are not specified, all features shall be in approximate proportion to those shown. The mass marked above the symbol shall not exceed the load imposed during the design type test (see 6.5.6.6.4) divided by 1.8.

NOTE: The provisions of 6.5.2.2.2 shall apply to all IBCs manufactured, repaired or remanufactured as from 1 January 2011. The provisions of 6.5.2.2.2 of the IMDG Code (Amendment 36-12) may continue to be applied to all IBCs manufactured, repaired or remanufactured between 1 January 2011 and 31 December 2016."

6.5.2.2.4 After "The date of the manufacture of the plastics inner receptacle may alternatively be marked on the inner receptacle adjacent to the remainder of the marking." add the following new sentence: "In such a case, the two digits of the year in the primary marking and in the inner circle of the clock shall be identical.". At the end, add a new "Note" to read as follows:

"**Note**: Other methods that provide the minimum required information in a durable, visible and legible form are also acceptable."

Chapter 6.6 – Provisions for the construction and testing of large packagings

6.6.2 Code for designating types of large packagings

6.6.2.2 At the beginning, replace "The letter "W"" with "The letters "T" or "W"" and insert a new second sentence to read as follows: "The letter "T" signifies a large salvage packaging conforming to the requirements of 6.6.5.1.9."

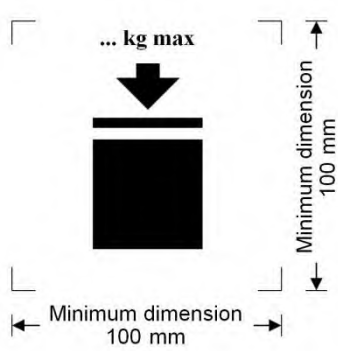
6.6.3 Marking

6.6.3.2 Insert a new second example to read as follows:

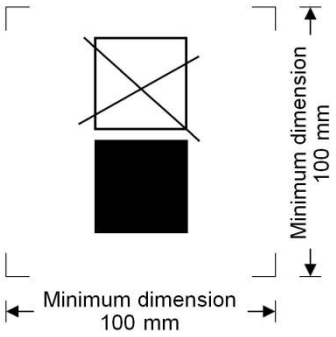
"	(un)	*50AT/Y/05/01/B/PQRS 2500/1000*	*For a large steel salvage packaging suitable for stacking; stacking load: 2 500 kg; maximum gross mass: 1,000 kg*."

Amend 6.6.3.3 to read as follows:

"6.6.3.3 The maximum permitted stacking load applicable when the large packaging is in use shall be displayed on a symbol as shown in the figures below. The symbol shall be durable and clearly visible.



Large packagings capable of being stacked



Large packagings NOT capable of being stacked

The minimum dimensions shall be 100 mm x 100 mm. The letters and numbers indicating the mass shall be at least 12 mm high. The area within the printer's marks indicated by the dimensional arrows shall be square. Where dimensions are not specified, all features shall be in approximate proportion to those shown. The mass marked above the symbol shall not exceed the load imposed during the design type test (see 6.6.5.3.3.4) divided by 1.8.

"**NOTE:** The provisions of 6.6.3.3 shall apply to all large packagings manufactured, repaired or remanufactured as from 1 January 2015. The provisions of 6.6.3.3 of the IMDG Code (Amendment 36-12) may continue to be applied to all IBCs manufactured, repaired or remanufactured between 1 January 2015 and 31 December 2016."

6.6.5 Test provisions for large packagings

6.6.5.1 Performance and frequency of test

6.6.5.1.9 Insert the following new paragraph to read as follows:

"6.6.5.1.9 *Large salvage packagings*

Large salvage packagings shall be tested and marked in accordance with the provisions applicable to packing group II large packagings intended for the transport of solids or inner packagings, except as follows:

(a) The test substance used in performing the tests shall be water, and the large salvage packagings shall be filled to not less than 98% of their maximum capacity. It is permissible to use additives, such as bags of lead shot, to achieve the requisite total package mass so long as they are placed so that the test results are not affected. Alternatively, in performing the drop test, the drop height may be varied in accordance with 6.6.5.3.4.4.2 (b);

(b) Large salvage packagings shall, in addition, have been successfully subjected to the leakproofness test at 30 kPa, with the results of this test reflected in the test report required by 6.6.5.4; and

(c) Large salvage packagings shall be marked with the letter "T" as described in 6.6.2.2."

Chapter 6.7 – Provisions for the design, construction, inspection and testing of portable tanks and multiple-element gas containers (ME GCs)

6.7.2 Provisions for the design, construction, inspection and testing of portable tanks intended for the transport of substances of class 1 and classes 3 to 9

6.7.2.20.2, 6.7.3.16.2 and 6.7.5.13.2 Replace "shall be marked" with "shall be durably marked".

6.7.5 Provisions for the design, construction, inspection and testing of multiple-element gas containers (MEGCs) intended for the transport of non-refrigerated gases

6.7.5.2.4.1 Replace "ISO 11114-1:1997" with "ISO 11114-1:2012".

Chapter 6.9 - Provisions for the design, construction, inspection and testing of bulk containers

6.9.4.6 Delete the footnote "*" assigned to BK, and insert the following note at the end:

Note: "(x)" shall be replaced with "1" or "2", as appropriate.

PART 7
PROVISIONS CONCERNING TRANSPORT OPERATIONS

Chapter 7.1 – General stowage provisions

7.1.3 Stowage categories

7.1.3.1 Stowage categories for class 1

7.1.3.1 In the paragraph replace the words "column 16" with "16a".

7.1.3.2 Stowage categories for classes 2 to 9

7.1.3.2 In the paragraph replace the words "column 16" with "16a".

7.1.4 Special stowage provisions

7.1.4.1 Stowage of empty uncleaned packagings, including IBCs and large packagings

7.1.4.1 In the paragraph replace the words "column 16" with "16a"

7.1.4.5 Stowage of goods of class 7

7.1.4.5.2 Replace "approval certificate" with "certificate of approval".

7.1.4.5.3.1 In the table amend the two first rows under the heading to read as follows:

Freight container	
Small freight container	50
Large freight container	50

and in the note "a" to the table, replace "7.1.4.5.6" with "7.1.4.5.5".

7.1.4.5.3.4 In the table amend the two first rows under the heading to read as follows:

Freight container		
Small freight container	50	n.a
Large freight container	50	100

Amend the end of note "b" to the table to read as follows: "… and stowed so as to maintain a spacing of at least 6 m from other groups."

and amend the end of the first sentence of note "c" to the table to read as follows: "… and stowed so as to maintain a spacing of at least 6 m from other groups."

7.1.4.5.10 Amend the end of the paragraph to read as follows:

"… and shall not be re-used unless the following conditions are fulfilled:

.1 the non-fixed contamination shall not exceed the limits specified in 4.1.9.1.2;

.2 the radiation level resulting from the fixed contamination shall not exceed 5 μSv/h at the surface."

7.1.4.5.13.2 Delete " to the critical group".

7.1.5 Stowage Codes

7.1.5 Insert a new 7.1.5 with the following:

"7.1.5 Stowage Codes

The stowage codes given in column 16a of the dangerous goods list are as specified below:

Stowage Code	Description
SW1	Protected from sources of heat.
SW2	Clear of living quarters.
SW3	Shall be transported under temperature control.
SW4	Surface ventilation is required to assist in removing any residual solvent vapour.
SW5	If under deck, stow in a mechanically ventilated space.
SW6	When stowed under-deck, mechanical ventilation shall be in accordance with SOLAS regulation II-2/19 (II-2/54) for flammable liquids with flashpoint below 23°C c.c.
SW7	As approved by the competent authorities of the countries involved in the shipment
SW8	Ventilation may be required. The possible need to open hatches in case of fire to provide maximum ventilation and to apply water in an emergency, and the consequent risk to the stability of the ship through flooding of the cargo spaces, shall be considered before loading.
SW9	Provide a good through ventilation for bagged cargo. Double strip stowage is recommended. The illustration in 7.6.2.7.2.3 shows how this can be achieved. During the voyage regular temperature readings shall be taken at varying depths in the hold and recorded. If the temperature of the cargo exceeds the ambient temperature and continues to increase, ventilation shall be closed down.

Stowage Code	Description
SW10	Unless carried in closed cargo transport units, bales shall be properly covered by tarpaulins or the like. Cargo spaces shall be clean, dry and free from oil or grease. Ventilator cowls leading into the cargo space shall have sparking-preventing screens. All other openings, entrances and hatches leading to the cargo space shall be securely closed. During temporary interruption of loading, when the hatch remains uncovered, a fire-watch shall be kept. During loading or discharge, smoking in the vicinity shall be prohibited and fire-fighting appliances kept ready for immediate operation.
SW11	Cargo transport units shall be shaded from direct sunlight. Packages in cargo transport units shall be stowed so as to allow for adequate air circulation throughout the cargo.
SW12	taking account of any supplementary requirements specified in the transport documents.
SW13	taking account of any supplementary requirements specified in the competent authority approval certificate(s).
SW14	Category A only if the special stowage provisions of 7.4.1.4 and 7.6.2.8.4 are complied with
SW15	For metal drums, stowage category B.
SW16	For unit loads in open cargo transport units, stowage category B.
SW17	Category E, for closed cargo transport unit and pallet boxes only. Ventilation may be required. The possible need to open hatches in case of fire to provide maximum ventilation and to apply water in an emergency, and the consequent risk to the stability of the ship through flooding of the cargo space, shall be considered before loading.
SW18	Category A, when transported in accordance with P650.
SW19	For batteries transported in accordance with SP 376 or SP 377 Category C, unless transported on a short international voyage.
SW20	For uranyl nitrate hexahydrate solution stowage category D applies.
SW21	For uranium metal pyrophoric and thorium metal pyrophoric stowage category D applies.
SW22	For AEROSOLS with a maximum capacity of 1 litre: Category A. For AEROSOLS with a capacity above 1 litre: Category B. For WASTE AEROSOLS: Category C, Clear of living quarters.
SW23	When transported in BK3 bulk container, see 7.6.2.12 and 7.7.3.9.
SW24	For special stowage provisions see 7.4.1.3 and 7.6.2.7.2.

Stowage Code	Description
SW25	For special stowage provisions see 7.6.2.7.3.
SW26	For special stowage provisions see 7.4.1.4 and 7.6.2.11.1.1.
SW27	For special stowage provisions see 7.6.2.7.2.1.
SW28	As approved by the competent authority of the country of origin.

"

7.1.6 Handling Codes

7.1.6 Insert a new 7.1.6 with the following:

"7.1.6 Handling Codes

The handling codes given in column 16a of the dangerous goods list are as specified below:

Handling Codes	Description
H1	Keep as dry as reasonably practicable
H2	Keep as cool as reasonably practicable
H3	During transport, it should be stowed (or kept) in a cool ventilated place
H4	If cleaning of cargo spaces has to be carried out at sea, the safety procedures followed and standard of equipment used shall be at least as effective as those employed as industry best practice in a port. Until such cleaning is undertaken, the cargo spaces in which the asbestos has been carried shall be closed and access to those spaces shall be prohibited.

"

Chapter 7.2 – General segregation provisions

7.2.3 Segregation provisions

7.2.3.1 In the paragraph, replace twice the words "column 16" with "column 16b".

7.2.3.4 In the paragraph, replace the words "column 16" with "column 16b".

7.2.4 Segregation table

in the row "Flammable gases 2.1" versus column of class 4.3 replace "X" with "2".

in the row "Flammable liquid 3" versus column of class 4.3 replace "1" with "2".

in the row "Substances which, in contact with water, emit flammable gases 4.3" versus column 2.1 replace "X" with "2".

in the row "Substances which, in contact with water, emit flammable gases 4.3" versus column 3 replace "1" with "2".

7.2.5 Segregation groups

7.2.3.1 In the paragraph, replace the words "column 16 (stowage and segregation)" with "column 16b"

7.2.6 Special segregation provisions and exemptions

7.2.6.4 In the paragraph, replace the words "column 16" with "column 16b".
and in "examples" replace "column 16" with "column 16b".

7.2.8 Segregation Codes

7.2.8 Insert a new 7.2.8 with the following:

"7.2.8 Segregation Codes

The segregation codes given in column 16b of the dangerous goods list are as specified below:

Segregation Codes	Description
SG1	For packages carrying a subsidiary risk of class 1, segregation as for class 1, division 1.3.
SG2	Segregation as for class 1.2G
SG3	Segregation as for Class 1.3G
SG4	Segregation as for class 2.1
SG5	Segregation as for class 3
SG6	Segregation as for class 5.1
SG7	Stow "away from" class 3
SG8	Stow "away from" class 4.1
SG9	Stow "away from" class 4.3
SG10	Stow "away from" class 5.1
SG11	Stow "away from" class 6.2
SG12	Stow "away from" class 7
SG13	Stow "away from" class 8

Segregation Codes	Description
SG14	Stow "separated from" class 1 except for division 1.4S
SG15	Stow "separated from" class 3
SG16	Stow "separated from" class 4.1
SG17	Stow "separated from" class 5.1
SG18	Stow "separated from" class 6.2
SG19	Stow "separated from" class 7
SG20	Stow "away from" acids
SG21	Stow "away from" alkalis
SG22	Stow "away from" ammonium salts
SG23	Stow "away from" animal or vegetable oils
SG24	Stow "away from" azides
SG25	Stow "separated from" goods of classes 2.1 and 3.
SG26	In addition: from goods of classes 2.1 and 3 when stowed on deck of a containership a minimum distance of two container spaces athwartship shall be maintained, when stowed on ro-ro ships a distance of 6 m athwartship shall be maintained.
SG27	Stow "away from" explosives containing chlorates or perchlorates
SG28	Stow "away from" ammonium compounds and explosives containing ammonium compounds or salts
SG29	Segregation from foodstuffs as in 7.3.4.2.2, 7.6.3.1.2 or 7.7.3.7.
SG30	Stow "away from" heavy metals and their salts
SG31	Stow "away from" lead and its compounds
SG32	Stow "away from" liquid halogenated hydrocarbons
SG33	Stow "away from" powdered metals
SG34	When containing ammonium compounds, "away from" chlorates or perchlorates and explosives containing chlorates or perchlorates.
SG35	Stow "separated from" acids.

Segregation Codes	Description
SG36	Stow "separated from" alkalis.
SG37	Stow "separated from" ammonia.
SG38	Stow "separated from" ammonium compounds.
SG39	Stow "separated from" ammonium compounds other than AMMONIUM PERSULPHATE (UN 1444).
SG40	Stow "separated from" ammonium compounds other than mixtures of ammonium persulphates and/or potassium persulphates and/or sodium persulphates.
SG41	Stow "separated from" animal or vegetable oil.
SG42	Stow "separated from" bromates.
SG43	Stow "separated from" bromine.
SG44	Stow "separated from" CARBON TETRACHLORIDE (UN 1846).
SG45	Stow "separated from" chlorates.
SG46	Stow "separated from" chlorine.
SG47	Stow "separated from" chlorites.
SG48	Stow "separated from" combustible material (particularly liquids). Combustible material does not include packing materials or dunnage.
SG49	Stow "separated from" cyanides
SG50	Segregation from foodstuffs as in 7.3.4.2.1, 7.6.3.1.2 or 7.7.3.6.
SG51	Stow "separated from" hypochlorites
SG52	Stow "separated from" iron oxide
SG53	Stow "separated from" liquid organic substances
SG54	Stow "separated from" mercury and mercury compounds
SG55	Stow "separated from" mercury salts
SG56	Stow "separated from" nitrites
SG57	Stow "separated from" odour-absorbing cargoes

Segregation Codes	Description
SG58	Stow "separated from" perchlorates
SG59	Stow "separated from" permanganates
SG60	Stow "separated from" peroxides
SG61	Stow "separated from" powdered metals
SG62	Stow "separated from" sulphur
SG63	Stow "separated longitudinally by an intervening complete compartment or hold from" Class 1.
SG64	*Reserved*
SG65	Stow "separated by a complete compartment or hold from" class 1 except for division 1.4.
SG66	*Reserved*
SG67	Stow "separated from" division 1.4 and "separated longitudinally by an intervening complete compartment of hold from" divisions 1.1, 1.2, 1.3, 1.5 and 1.6 except from explosives of compatibility group J.
SG68	If flashpoint 60°C c.c. or below, segregation as for class 3, but "away from" class 4.1.
SG69	For AEROSOLS with a maximum capacity of 1 litre: Segregation as for class 9. Stow "separated from" class 1 except for division 1.4. For AEROSOLS with a capacity above 1 litre: Segregation as for the appropriate subdivision of class 2. For WASTE AEROSOLS: Segregation as for the appropriate subdivision of class 2.
SG70	For arsenic sulphides, "separated from" acids
SG71	Within the appliance, to the extent that the dangerous goods are integral parts of the complete life-saving appliance, there is no need to apply the provisions on segregation of substances in chapter 7.2.
SG72	See 7.2.6.3.2.
SG73	*Reserved*
SG 74	Segregation as for 1.4G.
SG 75	Stow "separated from" strong acids.

"

Annex
Segregation flow chart

In the boxes, replace the words "column 16" with "column 16b",

Chapter 7.3 – Consigning operations concerning the packing and use of cargo transport units (CTUs) and related provisions

7.3.2 General provisions for cargo transport units

7.3.2.2 In the paragraph delete reference to footnote "* See IMO publication, sales number IB282E"

7.3.3 Packing of cargo transport units

7.3.3.1 The existing paragraph "7.3.3.1" is renumbered as "7.3.3.2".

7.3.3.1 Insert a new "7.3.3.1" with the following:

"7.3.3.1 Prior to the use of a cargo transport unit it shall be checked to ensure that it is apparently fit for its intended purpose*."

and add the corresponding footnote as follows:

"* For safety approval plates and maintenance and examination of containers see the International Convention for Safe Containers, 1972, as amended annex I regulations 1 and 2 (see 1.1.2.3)."

7.3.3.2 The existing "7.3.3.2" is renumbered as "7.3.3.3", and at the end, the following new sentence is added:

"Whenever the handling provision "keep as dry as reasonably practicable" (H1) is assigned in column (16a) of the dangerous goods list, the cargo transport unit including any contained goods, securing or packing materials shall be kept as dry as reasonably practicable."

7.3.4.2 Segregation in relation to foodstuffs

7.3.4.2.1 In the paragraph, replace the words "column 16" with "column 16b".

7.3.4.2.2 In subparagraph ".4", replace the words "column 16" with "column 16b".

7.3.7 Cargo transport units under temperature control

7.3.7.2 General provisions

7.3.7.2.4 Replace existing paragraph with the following:

"7.3.7.2.4 Prior to the use of cargo transport unit, the refrigeration system shall be subjected to a thorough inspection and a test to ensure that all parts are functioning properly.

7.3.7.2.4.1 Refrigerant gas shall only be replaced in accordance with the manufacturer's operating instructions for the refrigeration system. Prior to filling replacement refrigerant gas, a certificate of analysis from the supplier shall be obtained and checked to confirm that the

gas meets refrigeration system specifications. In addition, if concerns about the integrity of the supplier and/or the refrigerant gas supply chain give rise to suspicion to contamination of the gas**,** the replacement refrigerant gas shall be checked for possible contamination prior to use. If the refrigerant gas is found to be contaminated it shall not be used, the cylinder shall be plainly marked "CONTAMINATED", the cylinder shall be sealed and sent for recycling or disposal and notification shall be given to the refrigerant gas supplier and authorized distributor and competent authority(ies) of the countries to which the supplier and distributor reside, as appropriate. The date of last refrigerant replacement shall be included in the maintenance record of the refrigeration system.

Note: Contamination can be checked by using flame halide lamp tests, gas sniffer tube tests or gas chromatography. Replacement refrigerant gas cylinders may be marked with the test result and the date of testing."

Chapter 7.4 – Stowage and segregation on containerships

7.4.2 Stowage requirements

7.4.2.4 Ventilation provisions

7.4.2.4.1 In the paragraph, replace the words "column 16" with "column 16a".

Chapter 7.6 – Stowage and segregation on general cargo ships

7.6.2 Stowage and handling provisions

7.6.2.3 Ventilation provisions

7.6.2.3.1 In the paragraph, replace the words "column 16" with "column 16a".

7.6.3 Segregation provisions

7.6.3.1 Segregation from foodstuffs

7.6.3.1.2 In the paragraph, replace the words "column 16" with "column 16b".

Chapter 7.7 – Shipborne barges on barge-carrying ships

7.7.3 Barge loading

7.7.3.6 In the paragraph, replace the words "column 16" with "column 16b".

7.7.3.7 In subparagraph ".4", replace the words "column 16" with "column 16b".

7.7.4 Stowage of shipborne barges

7.7.4.1 In the paragraph, replace the words "column 16" with "column 16a".

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ANNEX 4

RESOLUTION MSC.328(90)
(adopted on 26 May 2012)

ADOPTION OF AMENDMENTS TO THE INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG) CODE

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.122(75) by which it adopted the International Maritime Dangerous Goods Code (hereinafter referred to as "the IMDG Code"), which has become mandatory under chapter VII of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended (hereinafter referred to as "the Convention"),

NOTING ALSO article VIII(b) and regulation VII/1.1 of the Convention concerning amendment procedure for amending the IMDG Code,

HAVING CONSIDERED, at its ninetieth session, amendments to the IMDG Code, proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the IMDG Code, the text of which is set out in the annex to the present resolution;

2. DETERMINES, in accordance with article VIII(b)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on 1 July 2013, unless prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet have notified their objections to the amendments;

3. INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2014 upon their acceptance in accordance with paragraph 2 above;

4. AGREES that Contracting Governments to the Convention may apply the aforementioned amendments in whole or in part on a voluntary basis as from 1 January 2013;

5. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the consolidated text of the amendments contained in the annex to all Contracting Governments to the Convention;

6. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization, which are not Contracting Governments to the Convention."

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Annex 1

List of Contents, Foreword, Preamble and parts 1 to 7, including appendices A and B

Contents

Foreword

The International Convention for the Safety of Life at Sea, 1974 (SOLAS), as amended, deals with various aspects of maritime safety and contains in chapter VII the mandatory provisions governing the carriage of dangerous goods in packaged form or in solid form in bulk. The carriage of dangerous goods is prohibited except in accordance with the relevant provisions of chapter VII, which are amplified by the International Maritime Dangerous Goods (IMDG) Code.

Regulation II-2/19 of the SOLAS Convention, as amended, specifies the special requirements for a ship intended to carry dangerous goods, the keel of which was laid or which was at a similar stage of construction on or after 1 July 2002.

The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL), deals with various aspects of prevention of marine pollution, and contains in its Annex III the mandatory provisions for the prevention of pollution by harmful substances carried by sea in packaged form. Regulation 1(2) prohibits the carriage of harmful substances in ships except in accordance with the provisions of Annex III, which are also amplified by the IMDG Code.

In accordance with the Provisions concerning Reports on Incidents Involving Harmful Substances (Protocol I to MARPOL), incidents involving losses of such substances from ships must be reported by the master or other person having charge of the ship concerned.

The IMDG Code that was adopted by resolution A.716(17) and amended by Amendments 27 to 30 was recommended to Governments for adoption or for use as the basis for national regulations in pursuance of their obligations under regulation VII/1.4 of the 1974 SOLAS Convention, as amended, and regulation 1(3) of Annex III of MARPOL. The IMDG Code, as amended, attained mandatory status from 1 January 2004 under the umbrella of SOLAS, 1974; however, some parts of the Code continue to be recommendatory. Observance of the Code harmonizes the practices and procedures followed in the carriage of dangerous goods by sea and ensures compliance with the mandatory provisions of the SOLAS Convention and of Annex III of MARPOL.

The Code, which sets out in detail the requirements applicable to each individual substance, material or article, has undergone many changes, in both layout and content, in order to keep pace with the expansion and progress of industry. IMO's Maritime Safety Committee (MSC) is authorized by the Organization's Assembly to adopt amendments to the Code, thus enabling IMO to respond promptly to developments in transport.

The MSC at its ninetieth session agreed that, in order to facilitate the multimodal transport of dangerous goods, the provisions of the IMDG Code, 2012, may be applied from 1 January 2013 on a voluntary basis, pending their official entry into force on 1 January 2014 without any transitional period. This is described in resolution MSC.328(90) and the Preamble to this Code. It needs to be emphasized that, in the context of the language of the Code, the words "shall", "should" and "may", when used in the Code, mean that the relevant provisions are "mandatory", "recommendatory" and "optional", respectively.

Reference marks

The following symbols placed against an item indicate changes from the previous edition, in accordance with Amendment 36-12 to the IMDG Code:

- ■ Insertion of an item
- ⊗ Deletion of an item
- △ Change to an item

For detailed information on changes, please visit **http://gisis.imo.org** and navigate to the IMDG Code module (free, instant registration required). Please inform IMO of any apparent discrepancies or errors in the texts of the different versions of the IMDG Code (IMO documents, the printed publication and CD/download and Internet versions of the Code) by means of the same link.

The IMDG Code is also available as a fully searchable database on CD or as a download (including the items within its Supplement). Intranet and Internet (subscription) versions are also available. For more information, please visit the IMO Publishing Service website at www.imo.org to see a live demonstration of the CD/download versions and obtain details of how online subscription to the IMDG Code works. If and when required, the IMO website will also include any files that show errata or corrigenda to this edition of the IMDG Code.

Preamble

1 Carriage of dangerous goods by sea is regulated in order to reasonably prevent injury to persons or damage to ships and their cargoes. Carriage of marine pollutants is primarily regulated to prevent harm to the marine environment. The objective of the IMDG Code is to enhance the safe carriage of dangerous goods while facilitating the free unrestricted movement of such goods and prevent pollution to the environment.

2 Over the years, many maritime countries have taken measures to regulate the transport of dangerous goods by sea. The various regulations, codes and practices, however, differed in their framework and, in particular, in the identification and labelling of such goods. Both the terminology used and the provisions for packaging and stowage varied from country to country and created difficulties for all directly or indirectly concerned with the transport of dangerous goods by sea.

3 The need for international regulation of the transport of dangerous goods by sea was recognized by the 1929 International Conference on Safety of Life at Sea (SOLAS), which recommended that rules on the subject have international effect. The classification of dangerous goods and certain general provisions concerning their transport in ships were adopted by the 1948 SOLAS Conference. This Conference also recommended further study with the object of developing international regulations.

4 Meanwhile, the Economic and Social Council of the United Nations had appointed an ad hoc Committee of Experts on the Transport of Dangerous Goods (UN Committee of Experts), which had been actively considering the international aspect of the transport of dangerous goods by all modes of transport. This committee completed a report in 1956 dealing with classification, listing and labelling of dangerous goods and with the transport documents required for such goods. This report, with subsequent modifications, offered a general framework to which existing regulations could be harmonized and within which they could be further developed. The primary goal being world-wide uniformity for regulations concerning the transport of dangerous goods by sea as well as other modes of transport.

5 As a further step towards meeting the need for international rules governing the transport of dangerous goods in ships, the 1960 SOLAS Conference, in addition to laying down a general framework of provisions in chapter VII of the SOLAS Convention, invited IMO (Recommendation 56) to undertake a study with a view to establishing a unified international code for the transport of dangerous goods by sea. This study would be pursued in co-operation with the UN Committee of Experts and should take account of existing maritime practices and procedures. The Conference further recommended that the unified code be prepared by IMO and that it be adopted by the Governments that were Parties to the 1960 Convention.

6 To implement Recommendation 56, IMO's Maritime Safety Committee (MSC) appointed a working group drawn from those countries having considerable experience in the transport of dangerous goods by sea. Preliminary drafts for each class of substances, materials and articles were subsequently brought under close scrutiny by the working group to take into account throughout the practices and procedures of a number of maritime countries in order to make the Code as widely acceptable as possible. This new International Maritime Dangerous Goods (IMDG) Code was approved by the MSC and recommended to Governments by the Assembly of IMO in 1965.

7 During another SOLAS Conference held in 1974, chapter VII of the Convention remained essentially unchanged. Since that date, several amendments to chapter VII adopted by the MSC have entered into force. Although invoked by a footnote reference in regulation 1 of chapter VII, the IMDG Code itself had only recommendatory status until 31 December 2003.

8 At the International Conference on Marine Pollution, 1973, the need was recognized to preserve the marine environment. It was further recognized that negligent or accidental release of marine pollutants transported by sea in packaged form should be minimized. Consequently, provisions were established and adopted by the Conference, and are contained in Annex III of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78). The Marine Environment Protection Committee (MEPC) decided in 1985 that Annex III should be implemented through the IMDG Code. This decision was also endorsed by the MSC in 1985. Since that date, several amendments to Annex III to MARPOL 73/78 have entered into force.

9 The UN Committee of Experts has continued to meet until the present day and its published "Recommendations on the Transport of Dangerous Goods" are updated biennially. In 1996, the MSC agreed that the IMDG Code should be reformatted consistent with the format of the UN Recommendations on the Transport of

Dangerous Goods. The consistency in format of the UN Recommendations, the IMDG Code and other dangerous goods transport regulations is intended to enhance user-friendliness, compliance with the regulations, and the safe transport of dangerous goods.

10 In 2002, the MSC adopted amendments to SOLAS chapter VII to make the IMDG Code mandatory, which came into force on 1 January 2004. Since then, further amendments were adopted to facilitate user friendliness and promote uniform implementation of the Code. In addition, at its 90th session in May 2012, the MSC adopted amendment 36-12 to the mandatory IMDG Code, which is a complete consolidated and updated version of its text and which will enter into force on 1 January 2014 without any transitional period. However, in accordance with resolution MSC ....., Governments were encouraged to apply this Amendment in whole or on part on a voluntary basis from 1 January 2013

11 In order to keep the Code up to date from the maritime transport operational aspect, the MSC will continue to take into account technological developments, as well as changes to chemical classifications and the related consignment provisions that primarily concern the shipper/consignor. The two-year periodicity of amendments to the UN Recommendations on Transport of Dangerous Goods will also provide the source of most future updating of the IMDG Code.

12 The MSC will also have regard to future implications for the carriage of dangerous goods by sea, in particular, arising from any acceptance by the UN Conference on Environmental Development (UNCED) of common criteria for the classification of chemicals on the basis of a Global Harmonization System (GHS).

13 Attention is drawn to IMO document FAL.6/Circ.14, a list of existing publications relevant to areas and topics relating to ship/port interface matters.

14 Advice on emergency procedures and for initial management of chemical poisoning and diagnosis that may be used in conjunction with the IMDG Code is published separately in "The EmS Guide: Emergency Response Procedures for Ships Carrying Dangerous Goods" (MSC.1/Circ.1025 as amended by MSC.1/Circ.1025/Add.1, MSC.1/Circ.1262, MSC.1/Circ.1360 and MSC.1/Circ.....) and in the "Medical First Aid Guide for Use in Accidents Involving Dangerous Goods" (see MSC/Circ.857 and DSC 3/15/Add.2), respectively.

15 In addition, referring to Part D of chapter VII of the SOLAS Convention, a ship transporting INF cargo, as defined in regulation VII/14.2, shall comply with the requirements of the International Code for the Safe Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes on board Ships (INF Code).

PART 1

GENERAL PROVISIONS, DEFINITIONS AND TRAINING

Chapter 1.1

General provisions

1.1.0 Introductory note

It should be noted that other international and national modal regulations exist and that those regulations may recognize all or part of the provisions of this Code. In addition, port authorities and other bodies and organizations should recognize the Code and may use it as a basis for their storage and handling bye-laws within loading and discharge areas.

1.1.1 Application and implementation of the Code

1.1.1.1 The provisions contained in this Code are applicable to all ships to which the International Convention for the Safety of Life at Sea, 1974 (SOLAS 74), as amended, applies and which are carrying dangerous goods as defined in regulation 1 of part A of chapter VII of that Convention.

1.1.1.2 The provisions of regulation II-2/19 of that Convention apply to passenger ships and to cargo ships constructed on or after 1 July 2002.

For:

.1 a passenger ship constructed on or after 1 September 1984 but before 1 July 2002; or

.2 a cargo ship of 500 gross tons or over constructed on or after 1 September 1984 but before 1 July 2002; or

.3 a cargo ship of less than 500 gross tons constructed on or after 1 February 1992 but before 1 July 2002,

the requirements of regulation II-2/54 of SOLAS, 1974, as amended by resolutions MSC.1(XLV), MSC.6(48), MSC.13(57), MSC.22(59), MSC.24(60), MSC.27(61), MSC.31(63) and MSC.57(67), apply (see II-2/1.2).

For cargo ships of less than 500 gross tons constructed on or after 1 September 1984 and before 1 February 1992, it is recommended that Contracting Governments extend such application to these cargo ships as far as possible.

1.1.1.3 All ships, irrespective of type and size, carrying substances, material or articles identified in this Code as marine pollutants are subject to the provisions of this Code.

1.1.1.4 In certain parts of this Code, a particular action is prescribed, but the responsibility for carrying out the action is not specifically assigned to any particular person. Such responsibility may vary according to the laws and customs of different countries and the international conventions into which these countries have entered. For the purpose of this Code, it is not necessary to make this assignment, but only to identify the action itself. It remains the prerogative of each Government to assign this responsibility.

1.1.1.5 Although this Code is legally treated as a mandatory instrument under chapter VII of SOLAS 74, as amended, the following provisions of the Code remain recommendatory:

.1 paragraph 1.1.1.8 (Notification of infringements);

.2 paragraphs 1.3.1.4 to 1.3.1.7 (Training);

.3 chapter 1.4 (Security provisions) except 1.4.1.1, which is mandatory;

.4 section 2.1.0 of chapter 2.1 (Class 1 – Explosives, Introductory notes);

.5 section 2.3.3 of chapter 2.3 (Determination of flashpoint);

.6 columns (15) and (17) of the Dangerous Goods List in chapter 3.2;

.7 The segregation flow chart and example in the annex to chapter 7.2

.8 section 5.4.5 of chapter 5.4 (Multimodal Dangerous Goods Form), insofar as the layout of the form is concerned;

.9 chapter 7.8 (Special provisions in the event of an incident and fire precautions involving dangerous goods);

.10 section 7.9.3 (Contact information for the main designated national competent authorities); and

.11 appendix B.

1.1.1.6 Application of standards

Where the application of a standard is required and there is any conflict between the standard and the provisions of this Code, the provisions of this Code take precedence.

1.1.1.7 Transport of dangerous goods used as a coolant or conditioner

Dangerous goods, that are only asphyxiant (which dilute or replace the oxygen normally in the atmosphere), when used in cargo transport units for cooling or conditioning purposes are only subject to the provisions of section 5.5.3.

Note: When carried on board as ship's stores or equipment, these coolants and conditioners are not subject to the provisions of this Code

1.1.1.8 Notification of infringements

When a competent authority has reasons to believe that the safety of the transport of dangerous goods is compromised as a result of serious or repeated infringements of this Code by an enterprise which has its headquarters on the territory of another competent authority, it should if necessary notify that competent authority of such infringements.

1.1.2 Conventions

1.1.2.1 International Convention for the Safety of Life at Sea, 1974

Part A of chapter VII of the International Convention for the Safety of Life at Sea, 1974 (SOLAS 1974), as amended, deals with the carriage of dangerous goods in packaged form, and is reproduced in full:

CHAPTER VII
Carriage of Dangerous Goods

Part A
Carriage of Dangerous Goods in Packaged Form

Regulation 1
Definitions

For the purpose of this chapter, unless expressly provided otherwise:

1 *IMDG Code* means the International Maritime Dangerous Goods (IMDG) Code adopted by the Maritime Safety Committee of the Organization by resolution MSC.122(75), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the annex other than chapter I.

2 *Dangerous goods* mean the substances, materials and articles covered by the IMDG Code.

3 *Packaged form* means the form of containment specified in the IMDG Code.

Regulation 2
Application[*]

1 Unless expressly provided otherwise, this part applies to the carriage of dangerous goods in packaged form in all ships to which the present regulations apply and in cargo ships of less than 500 gross tonnage.

[*] Refer to:
.1 part D which contains special requirements for the carriage of INF cargo; and

2 The provisions of this part do not apply to ships' stores and equipment.

3 The carriage of dangerous goods in packaged form is prohibited except in accordance with the provisions of this chapter.

4 To supplement the provisions of this part, each Contracting Government shall issue, or cause to be issued, detailed instructions on emergency response and medical first aid relevant to incidents involving dangerous goods in packaged form, taking into account the guidelines developed by the Organization.*

Regulation 3
Requirements for the carriage of dangerous goods

The carriage of dangerous goods in packaged form shall comply with the relevant provisions of the IMDG Code.

Regulation 4†
Documents

1 Transport information relating to the carriage of dangerous goods in packaged form and the container/vehicle packing certificate shall be in accordance with the relevant provisions of the IMDG Code and shall be made available to the person or organization designated by the port State authority.

2 Each ship carrying dangerous goods in packaged form shall have a special list, manifest or stowage plan setting forth, in accordance with the relevant provisions of the IMDG Code, the dangerous goods on board and the location thereof. A copy of one of these documents shall be made available before departure to the person or organization designated by the port State authority.

Regulation 5
Cargo Securing Manual

Cargo, cargo units‡ and cargo transport units, shall be loaded, stowed and secured throughout the voyage in accordance with the Cargo Securing Manual approved by the Administration. The Cargo Securing Manual shall be drawn up to a standard at least equivalent to the guidelines developed by the Organization.§

Regulation 6
Reporting of incidents involving dangerous goods

1 When an incident takes place involving the loss or likely loss overboard of dangerous goods in packaged form into the sea, the master, or other person having charge of the ship, shall report the particulars of such an incident without delay and to the fullest extent possible to the nearest coastal State. The report shall be drawn up based on general principles and guidelines developed by the Organization.¶

2 In the event of the ship referred to in paragraph 1 being abandoned, or in the event of a report from such a ship being incomplete or unobtainable, the company, as defined in regulation IX/1.2, shall, to the fullest extent possible, assume the obligations placed upon the master by this regulation.

1.1.2.2 International Convention for the Prevention of Pollution from Ships, MARPOL 1973/78

1.1.2.2.1 Annex III of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), deals with the prevention of pollution by harmful

.2 regulation II-2/19 which contains special requirements for ships carrying dangerous goods.

* Refer to:
.1 the *Emergency Response Procedures for Ships Carrying Dangerous Goods* (EmS Guide) (MSC.1/Circ.1025, as amended); and
.2 the *Medical First Aid Guide for Use in Accidents Involving Dangerous Goods* (MFAG) (MSC/Circ.857), published by the Organization.

† The revised text of Regulation 4 was adopted by [Resolution MSC.....(90)], which will enter into force on 1 January 2014, which is the mandatory entry into force date of amendment 36-12 of the IMDG code.

‡ As defined in the Code of Safe Practice for Cargo Stowage and Securing (CSS Code), adopted by the Organization by resolution A.714(17), as amended.

§ Refer to the Revised Guidelines for the preparation of the Cargo Securing Manual (MSC.1/Circ.1353).

¶ Refer to the General principles for ship reporting systems and ship reporting requirements, including guidelines for reporting incidents involving dangerous goods, harmful substances and/or marine pollutants, adopted by the Organization by resolution A.851(20), as amended.

substances carried by sea in packaged form and is reproduced in full, as revised by the Marine Environment Protection Committee.*

Annex III
Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form

Regulation 1
Application

1 Unless expressly provided otherwise, the regulations of this Annex apply to all ships carrying harmful substances in packaged form.

.1 For the purpose of this Annex, "harmful substances" are those substances which are identified as marine pollutants in the International Maritime Dangerous Goods Code (IMDG Code)† or which meet the criteria in the Appendix of this Annex.

.2 For the purposes of this Annex, "packaged form" is defined as the forms of containment specified for harmful substances in the IMDG Code.

2 The carriage of harmful substances is prohibited, except in accordance with the provisions of this Annex.

3 To supplement the provisions of this Annex, the Government of each Party to the Convention shall issue, or cause to be issued, detailed requirements on packing, marking, labelling, documentation, stowage, quantity limitations and exceptions for preventing or minimizing pollution of the marine environment by harmful substances.*

4 For the purposes of this Annex, empty packagings which have been used previously for the carriage of harmful substances shall themselves be treated as harmful substances unless adequate precautions have been taken to ensure that they contain no residue that is harmful to the marine environment.

5 The requirements of this Annex do not apply to ship's stores and equipment.

Regulation 2
Packing

Packages shall be adequate to minimize the hazard to the marine environment, having regard to their specific contents.

Regulation 3
Marking and labelling

1 Packages containing a harmful substance shall be durably marked or labelled to indicate that the substance is a harmful substance in accordance with the relevant provisions of the IMDG Code.

2 The method of affixing marks or labels on packages containing a harmful substance shall be in accordance with the relevant provisions of the IMDG Code.

Regulation 4‡
Documentation

1 Transport information relating to the carriage of harmful substances shall be in accordance with the relevant provisions of the IMDG Code and shall be made available to the person or organization designated by the port State authority.

2 Each ship carrying harmful substances shall have a special list, manifest or stowage plan setting forth, in accordance with the relevant provisions of the IMDG Code, the harmful substances on board and the location thereof. A copy of one of these documents shall be made available before departure to the person or organization designated by the port State authority.

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* The revised text of Annex III was adopted by resolution MEPC.193(61), which will enter into force on 1 January 2014, which is the mandatory entry into force date of amendment 36-12 to the IMDG Code.

† Refer to the IMDG Code adopted by the Organization by resolution MSC.122(75), as amended by the Maritime Safety Committee

‡ Reference to "documents" in this regulation does not preclude the use of electronic data processing (EDP) and electronic data interchange (EDI) transmission techniques as an aid to paper documentation.

Regulation 5
Stowage

Harmful substances shall be properly stowed and secured so as to minimize the hazards to the marine environment without impairing the safety of the ship and persons on board.

Regulation 6
Quantity limitations

Certain harmful substances may, for sound scientific and technical reasons, need to be prohibited for carriage or be limited as to the quantity which may be carried aboard any one ship. In limiting the quantity, due consideration shall be given to size, construction and equipment of the ship, as well as the packaging and the inherent nature of the substances.

Regulation 7
Exceptions

1 Jettisoning of harmful substances carried in packaged form shall be prohibited, except where necessary for the purpose of securing the safety of the ship or saving life at sea.

2 Subject to the provisions of the present Convention, appropriate measures based on the physical, chemical and biological properties of harmful substances shall be taken to regulate the washing of leakages overboard, provided that compliance with such measures would not impair the safety of the ship and persons on board.

Regulation 8
Port State control on operational requirements[*]

1 A ship when in a port or an offshore terminal of another Party is subject to inspection by officers duly authorized by such Party concerning operational requirements under this Annex.

2 Where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of pollution by harmful substances, the Party shall take such steps, including carrying out detailed inspection and, if required, will ensure that the ship shall not sail until the situation has been brought to order in accordance with the requirements of this Annex.

3 Procedures relating to the port State control prescribed in article 5 of the present Convention shall apply to this regulation.

4 Nothing in this regulation shall be construed to limit the rights and obligations of a Party carrying out control over operational requirements specifically provided for in the present Convention.

Appendix to Annex III
Criteria for the identification of harmful substances in packaged form

For the purposes of this Annex, substances identified by any one of the following criteria are harmful substances:[†]

(a) Acute (short-term) aquatic hazard

Category: Acute 1	
96 hr LC_{50} (for fish)	$\leq$ 1 mg/ℓ and/or
48 hr EC_{50} (for crustacea)	$\leq$ 1 mg/ℓ and/or
72 or 96 hr ErC_{50} (for algae or other aquatic plants)	$\leq$ 1 mg/ℓ

[*] Refer to the Procedures for port State control adopted by the Organization by resolution A.787(19) and amended by resolution A.882(21).

[†] The criteria are based on those developed by the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS), as amended. For definitions of acronyms or terms used in this appendix, refer to the relevant paragraphs of the IMDG Code.

(b) Long-term aquatic hazard

(i) Non-rapidly degradable substances for which there are adequate chronic toxicity data available

Category: Chronic 1	
Chronic NOEC or EC_x (for fish)	$\leq$ 0.1 mg/ℓ and/or
Chronic NOEC or ECx (for crustacea)	$\leq$ 0.1 mg/ℓ and/or
Chronic NOEC or ECx (for algae or other aquatic plants)	$\leq$ 0.1 mg/ℓ

Category: Chronic 2	
Chronic NOEC or ECx (for fish)	$\leq$ 1 mg/ℓ and/or
Chronic NOEC or ECx (for crustacea)	$\leq$ 1 mg/ℓ and/or
Chronic NOEC or ECx (for algae or other aquatic plants)	$\leq$ 1 mg/ℓ

(ii) Rapidly degradable substances for which there are adequate chronic toxicity data available

Category Chronic 1:	
Chronic NOEC or ECx (for fish)	$\leq$ 0.01 mg/ℓ and/or
Chronic NOEC or ECx (for crustacea)	$\leq$ 0.01 mg/ℓ and/or
Chronic NOEC or ECx (for algae or other aquatic plants)	$\leq$ 0.01 mg/ℓ

Category Chronic 2:	
Chronic NOEC or ECx (for fish)	$\leq$ 0.1 mg/ℓ and/or
Chronic NOEC or ECx (for crustacea)	$\leq$ 0.1 mg/ℓ and/or
Chronic NOEC or ECx (for algae or other aquatic plants)	$\leq$ 0.1 mg/ℓ

(iii) Substances for which adequate chronic toxicity data are not available

Category Chronic 1:	
96 hr LC50 (for fish)	$\leq$ 1 mg/ℓ and/or
48 hr EC50 (for crustacea)	$\leq$ 1 mg/ℓ and/or
72 or 96 hr ErC50 (for algae or other aquatic plants)	$\leq$ 1 mg/ℓ
and the substance is not rapidly degradable and/or the experimentally determined BCF is $\geq$ 500 (or, if absent the log Kow $\geq$ 4).	

Category Chronic 2:	
96 hr LC50 (for fish)	>1 mg/ℓ but $\leq$ 10 mg/ℓ and/or
48 hr EC50 (for crustacea)	>1 mg/ℓ but $\leq$ 10 mg/ℓ and/or
72 or 96 hr ErC50 (for algae or other aquatic plants)	>1 mg/ℓ but $\leq$ 10 mg/ℓ
and the substance is not rapidly degradable and/or the experimentally determined BCF is $\geq$ 500 (or, if absent, the log Kow $\geq$ 4).	

Additional guidance on the classification process for substances and mixtures is included in the IMDG Code.

1.1.3 Dangerous goods forbidden from transport

1.1.3.1 Unless provided otherwise by this Code, the following are forbidden from transport:

Any substance or article which, as presented for transport, is liable to explode, dangerously react, produce a flame or dangerous evolution of heat or dangerous emission of toxic, corrosive or flammable gases or vapours under normal conditions of transport.

In chapter 3.3, special provisions 349, 350, 351, 352, 353 and 900 list certain substances, which are forbidden for transport.

Chapter 1.2

Definitions, units of measurement and abbreviations

1.2.1 Definitions

The following is a list of definitions of general applicability that are used throughout this Code. Additional definitions of a highly specific nature are presented in the relevant chapters.

For the purposes of this Code:

Aerosols or *aerosol dispensers* means non-refillable receptacles meeting the provisions of 6.2.4, 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.

Alternative arrangement means an approval granted by the competent authority for a portable tank or MEGC that has been designed, constructed or tested to technical requirements or testing methods other than those specified in this Code (see, for instance, 6.7.5.11.1).

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

Approval

Multilateral approval, for the transport of class 7 material, means approval by the relevant competent authority of the country of origin of the design or shipment, as applicable, and also, where the consignment is to be transported through or into any other country, approval by the competent authority of that country.

Unilateral approval, for the transport 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.

Bags means flexible packagings made of paper, plastic film, textiles, woven material, or other suitable materials.

Barge-carrying ship means a ship specially designed and equipped to transport shipborne barges.

Barge feeder vessel means a vessel specially designed and equipped to transport shipborne barges to or from a barge-carrying ship.

Boxes means packagings with complete rectangular or polygonal faces, made of metal, wood, plywood, reconstituted wood, fibreboard, plastics, or other suitable material. Small holes for purposes such as ease of the handling or opening of the box or to meet classification provisions are permitted as long as they do not compromise the integrity of the packaging during transport.

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

Bulk containers:

- are of a permanent character and accordingly strong enough to be suitable for repeated use;
- are specially designed to facilitate the transport of goods by one or more means of transport without intermediate reloading;
- are fitted with devices permitting ready handling; and
- have a capacity of not less than 1 cubic metre.

Examples of bulk containers are freight containers, offshore bulk containers, skips, bulk bins, swap bodies, trough-shaped containers, roller containers, load compartments of vehicles or flexible bulk containers.

Bundles of cylinders are assemblies of cylinders that are fastened together and which are interconnected by a manifold and transported as a unit. The total water capacity shall not exceed 3000 litres except that bundles intended for the transport of gases of class 2.3 shall be limited to 1000 litres water capacity.

Cargo transport unit means a road transport tank or freight vehicle, a railway transport tank or freight wagon, a multimodal freight container or portable tank, or an MEGC.

Carrier means any person, organization or Government undertaking the transport of dangerous goods by any means of transport. The term includes both carriers for hire or reward (known as *common* or *contract carriers* in some countries) and carriers on own account (known as *private carriers* in some countries).

Cellular ship means a ship in which containers are loaded under deck into specially designed slots giving a permanent stowage of the container during sea transport. Containers loaded on deck in such a ship are specially stacked and secured on fittings.

Closed cargo transport unit, with the exception of class 1, means a cargo transport unit which totally encloses the contents by permanent structures with complete and rigid surfaces. Cargo transport units with fabric sides or tops are not considered closed cargo transport units; for definition of closed cargo transport unit for class 1, see 7.1.2.

Closed ro–ro cargo space means a ro–ro cargo space which is neither an open ro–ro cargo space nor a weather deck.

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

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

Competent authority means any body or authority designated or otherwise recognized as such for any purpose in connection with this Code.

Compliance assurance means a systematic programme of measures applied by a competent authority which is aimed at ensuring that the provisions of this Code are met in practice.

Composite packagings means packagings consisting of an outer packaging and an inner receptacle so constructed that the inner receptacle and the outer packaging form an integral packaging. Once assembled, it remains thereafter an integrated single unit; it is filled, stored, transported and emptied as such.

Confinement system, for the transport 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 any person, organization or Government which is entitled to take delivery of a consignment.

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

Consignor means any person, organization or Government which prepares a consignment for transport.

Containment system, for the transport of class 7 material, means the assembly of components of the packaging specified by the designer as intended to retain the radioactive material during transport.

Control temperature means the maximum temperature at which certain substances (such as organic peroxides and self-reactive and related substances) can be safely transported during a prolonged period of time.

Conveyance means:

.1 for transport by road or rail: any vehicle,

.2 for transport by water: any ship, or any cargo space or defined deck area of a ship,

.3 for transport by air: any aircraft.

Crates are outer packagings with incomplete surfaces.

Criticality safety index (CSI) assigned to a package, overpack or freight container containing fissile material, for the transport of class 7 material, means a number which is used to provide control over the accumulation of packages, overpacks or freight containers containing fissile material.

Critical temperature is the temperature above which the substance cannot exist in the liquid state.

Cryogenic receptacles are transportable thermally insulated receptacles for refrigerated liquefied gases, of a water capacity of not more than 1000 litres.

Cylinders are transportable pressure receptacles of a water capacity not exceeding 150 litres.

Defined deck area means the area, of the weather deck of a ship, or of a vehicle deck of a roll-on/roll-off ship, which is allocated for the stowage of dangerous goods.

Design, for the transport 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.

Drums means flat-ended or convex-ended cylindrical packagings made of metal, fibreboard, plastics, plywood or other suitable materials. This definition also includes packagings of other shapes, such as round taper-necked packagings, or pail-shaped packagings. Wooden barrels and jerricans are not covered by this definition.

Elevated temperature substance means a substance which is transported or offered for transport:

- in the liquid state at a temperature at or above 100°C
- in the liquid state with a flashpoint above 60°C that is intentionally heated to a temperature above its flashpoint; or
- in the solid state at a temperature at or above 240°C.

Emergency temperature means the temperature at which emergency procedures shall be implemented.

Exclusive use, for the transport of class 7 material, means the sole use, by a single consignor, of a conveyance or of a large freight 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.

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.

Flashpoint means the lowest temperature of a liquid at which its vapour forms an ignitable mixture with air.

Foodstuff includes foodstuffs, feeds or other edible substances intended for consumption by humans or animals

Freight container means an article of transport equipment that is of a permanent character and accordingly strong enough to be suitable for repeated use; specially designed to facilitate the transport of goods, by one or more modes of transport, without intermediate reloading; designed to be secured and/or readily handled, having fittings for these purposes, and approved in accordance with the International Convention for Safe Containers (CSC), 1972, as amended. The term "freight container" includes neither vehicle nor packaging. However, a freight container that is carried on a chassis is included.

For freight containers for the transport of radioactive material, a freight container may be used as a packaging. A small freight container is that which has either any overall outer dimension less than 1.5 m, or an internal volume of not more than 3 m^3. Any other freight container is considered to be a large freight container.

Fuel cell means an electrochemical device that converts the chemical energy of a fuel to electrical energy, heat and reaction products.

Fuel cell engine means a device used to power equipment and which consists of a fuel cell and its fuel supply, whether integrated with or separate from the fuel cell, and includes all appurtenances necessary to fulfil its function.

GHS means the third 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.4.

IMO type 4 tank means a road tank vehicle for the transport of dangerous goods of classes 3 to 9 and includes a semi-trailer with a permanently attached tank or a tank attached to a chassis, with at least four twist locks that take account of ISO standards (i.e. ISO International Standard 1161:1984).

IMO type 6 tank means a road tank vehicle for the transport of non-refrigerated liquefied gases of class 2 and includes a semi-trailer with a permanently attached tank or a tank attached to a chassis which is fitted with items of service equipment and structural equipment necessary for the transport of gases.

IMO type 8 tank means a road tank vehicle for the transport of refrigerated liquefied gases of class 2 and includes a semi-trailer with a permanently attached thermally insulated tank fitted with items of service equipment and structural equipment necessary for the transport of refrigerated liquefied gases.

Inner packagings means packagings for which an outer packaging is required for transport.

Inner receptacles means receptacles which require an outer packaging in order to perform their containment function.

Inspection body means an independent inspection and testing body approved by the competent authority.

Intermediate bulk containers (IBCs) means rigid or flexible portable packagings, other than specified in chapter 6.1, that:

.1 have a capacity of:

.1 not more than 3.0 m^3 (3000 litres) for solids and liquids of packing groups II and III;

.2 not more than 1.5 m^3 for solids of packing group I when packed in flexible, rigid plastics, composite, fibreboard or wooden IBCs;

.3 not more than 3.0 m^3 for solids of packing group I when packed in metal IBCs;

.4 not more than 3.0 m^3 for radioactive material of class 7;

.2 are designed for mechanical handling; and

.3 are resistant to the stresses produced in handling and transport, as determined by tests.

Remanufactured IBCs are metal, rigid plastics or composite IBCs that:

.1 are produced as a UN type from a non-UN type; or

.2 are converted from one UN design type to another UN design type.

Remanufactured IBCs are subject to the same provisions of this Code that apply to new IBCs of the same type (see also design type definition in 6.5.6.1.1).

Repaired IBCs are metal, rigid plastics or composite IBCs that, as a result of impact or for any other cause (e.g. corrosion, embrittlement or other evidence of reduced strength as compared to the design type) are restored so as to conform to the design type and to be able to withstand the design type tests. For the purposes of this Code, the replacement of the rigid inner receptacle of a composite IBC with a receptacle conforming to the original design type from the same manufacturer is considered repair. However, routine maintenance of rigid IBCs (see definition below) is not considered repair. The bodies of rigid plastics IBCs and the inner receptacles of composite IBCs are not repairable. Flexible IBCs are not repairable, unless approved by the competent authority.

Routine maintenance of flexible IBCs is the routine performance on plastics or textile flexible IBCs of operations, such as:

.1 cleaning; or

.2 replacement of non-integral components, such as non-integral liners and closure ties, with components conforming to the original manufacturer's specification;

provided that these operations do not adversely affect the containment function of the flexible IBC or alter the design type.

Note: For rigid IBCs, see "Routine maintenance of rigid IBCs".

Routine maintenance of rigid IBCs is the routine performance on metal, rigid plastics or composite IBCs of operations such as:

.1 cleaning;

.2 removal and reinstallation or replacement of body closures (including associated gaskets), or of service equipment, conforming to the original manufacturer's specifications, provided that the leaktightness of the IBC is verified; or

.3 restoration of structural equipment not directly performing a dangerous goods containment or discharge pressure retention function so as to conform to the design type (e.g. the straightening of legs or lifting attachments) provided that the containment function of the IBC is not affected.

Note: For flexible IBCs, see "Routine maintenance of flexible IBCs".

Intermediate packagings means packagings placed between inner packagings, or articles, and an outer packaging.

Jerricans means metal or plastics packagings of rectangular or polygonal cross-section.

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

.1 are designed for mechanical handling; and

.2 exceed 400 kg net mass or 450 ℓ capacity but have a volume of not more than 3 m^3.

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

Liquids are dangerous goods which at 50°C have a vapour pressure of not more than 300 kPa (3 bar), which are not completely gaseous at 20°C and at a pressure of 101.3 kPa, and which have a melting point or initial melting point of 20°C or less at a pressure of 101.3 kPa. 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 section 2.3.4 of Annex A of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), as amended.

Long international voyage means an international voyage that is not a short international voyage.

Manual of Tests and Criteria means the fifth revised edition of the United Nations publication entitled "Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria" (ST/SG/AC.10/11/Rev.5 as amended by ST/SG/AC.10/11/Rev.5/Amend.1).

Maximum capacity as used in 6.1.4 means the maximum inner volume of receptacles or packagings expressed in litres.

Maximum net mass as used in 6.1.4 means the maximum net mass of contents in a single packaging or maximum combined mass of inner packagings and the contents thereof and is expressed in kilograms.

Maximum normal operating pressure, for the transport 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 transport.

Metal hydride storage system means a single complete hydrogen storage system, including a receptacle, metal hydride, pressure relief device, shut-off valve, service equipment and internal components used for the transport of hydrogen only.

Multiple-element gas containers (MEGCs) are multimodal assemblies of cylinders, tubes and bundles of cylinders which are interconnected by a manifold and which are assembled within a framework. The MEGC includes service equipment and structural equipment necessary for the transport of gases.

Net explosive mass (NEM) means the total mass of the explosive substances, without the packagings, casings, etc. (*Net explosive quantity (NEQ)*, *net explosive contents (NEC)*, or *net explosive weight (NEW)* are often used to convey the same meaning.)

Offshore bulk container means a bulk container specially designed for repeated use for the transport of dangerous goods to, from and between offshore facilities. An offshore bulk container is designed and constructed in accordance with MSC/Circ.860 "Guidelines for the approval of offshore containers handled in open seas".

Open cargo transport unit means a unit which is not a closed cargo transport unit.

Open cryogenic receptacle means a transportable thermally insulated receptacle for refrigerated liquefied gases maintained at atmospheric pressure by continuous venting of the refrigerated liquefied gas.

Open ro–ro cargo space means a ro–ro cargo space either open at both ends, or open at one end and provided with adequate natural ventilation effective over its entire length through permanent openings in the side plating or deckhead to the satisfaction of the Administration.

Outer packaging means the outer protection of a 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 to contain one or more packages and to form one unit for the convenience of handling and stowage during transport. Examples of overpacks are a number of packages either:

.1 placed or stacked on to a load board, such as a pallet, and secured by strapping, shrink-wrapping, stretch-wrapping, or other suitable means; or

.2 placed in a protective outer packaging such as a box or crate.

Overstowed means that a package or container is directly stowed on top of another.

Package means the complete product of the packing operation, consisting of the packaging and its contents prepared for transport.

Packaging means one or more receptacles and any other components or materials necessary for the receptacles to perform their containment and other safety functions.

Pressure drums are welded transportable pressure receptacles of a water capacity exceeding 150 litres and of not more than 1000 litres (e.g. cylindrical receptacles equipped with rolling hoops, spheres on skids).

Pressure receptacles is a collective term that includes cylinders, tubes, pressure drums, closed cryogenic receptacles, metal hydride storage systems, bundles of cylinders and salvage pressure receptacles.

Quality assurance means a systematic programme of controls and inspections applied by any organization or body which is aimed at providing adequate confidence that the standard of safety prescribed in this Code is achieved in practice.

Radiation level, for the transport of class 7 material, means the corresponding dose rate expressed in millisieverts per hour.

Radioactive contents, for the transport of class 7 material, mean the radioactive material together with any contaminated or activated solids, liquids, and gases within the packaging.

Receptacles means containment vessels for receiving and holding substances or articles, including any means of closing.

Reconditioned packagings include:

.1 metal drums that:
  .1 are cleaned to original materials of construction, with all former contents, internal and external corrosion, and external coatings and labels removed;
  .2 are restored to original shape and contour, with chimes (if any) straightened and sealed, and all non-integral gaskets replaced; and
  .3 are inspected after cleaning, but before painting, with rejection of packagings with visible pitting, significant reduction in material thickness, metal fatigue, damaged threads or closures, or other significant defects;

.2 plastic drums and jerricans that:
  .1 are cleaned to original materials of construction, with all former contents, external coatings and labels removed;
  .2 have all non-integral gaskets replaced; and
  .3 are inspected after cleaning, with rejection of packagings with visible damage such as tears, creases or cracks, or damaged threads or closures, or other significant defects.

Recycled plastics material means material recovered from used industrial packagings that has been cleaned and prepared for processing into new packagings. The specific properties of the recycled material used for production of new packagings shall be assured and documented regularly as part of a quality assurance programme recognized by the competent authority. The quality assurance programme shall include a record of proper pre-sorting and verification that each batch of recycled plastics material has the proper melt flow rate, density, and tensile yield strength, consistent with that of the design type manufactured from such recycled material. This necessarily includes knowledge about the packaging material from which the recycled plastics have been derived, as well as awareness of the prior contents of those packagings if those prior contents might reduce the capability of new packagings produced using that material. In addition, the packaging manufacturer's quality assurance programme under 6.1.1.3 shall include performance of the mechanical design type test in 6.1.5 on packagings manufactured from each batch of recycled plastics material. In this testing, stacking performance may be verified by appropriate dynamic compression testing rather than static load testing.

Note: ISO 16103:2005 "Packaging – Transport packages for dangerous goods – Recycled plastics material", provides additional guidance on procedures to be followed in approving the use of recycled plastics material.

Remanufactured IBCs (see *Intermediate bulk containers (IBCs)*).

Remanufactured large packaging means a metal or rigid plastics large packaging that:

.1 is produced as a UN type from a non-UN type; or

.2 is converted from one UN design type to another UN design type.

Remanufactured large packagings are subject to the same provisions of this Code that apply to new large packagings of the same type (see also design type definition in 6.6.5.1.2).

Remanufactured packagings include:

.1 metal drums that:
  .1 are produced as a UN type from a non-UN type;
  .2 are converted from one UN type to another UN type; or
  .3 undergo the replacement of integral structural components (such as non-removable heads); or

.2 plastic drums that:
  .1 are converted from one UN type to another UN type (such as 1H1 to 1H2); or
  .2 undergo the replacement of integral structural components.

Remanufactured drums are subject to the same provisions of this Code that apply to a new drum of the same type.

Repaired IBCs (see *Intermediate bulk containers (IBCs)*).

Re-used large packaging means a large packaging to be refilled which has been examined and found free of defects affecting the ability to withstand the performance tests: the term includes those which are refilled with the same or similar compatible contents and are transported within distribution chains controlled by the consignor of the product.

Re-used packagings means packagings to be refilled which have been examined and found free of defects affecting the ability to withstand the performance tests; the term includes those which are refilled with the same or similar compatible contents and are transported within distribution chains controlled by the consignor of the product.

Road tank vehicle means a vehicle equipped with a tank with a capacity of more than 450 litres, fitted with pressure-relief devices.

Ro–ro cargo space means spaces not normally subdivided in any way and extending to either a substantial length or the entire length of the ship in which goods (packaged or in bulk, in or on rail or road cars, vehicles (including road or rail tankers), trailers, containers, pallets, demountable tanks or in or on similar stowage units or other receptacles) can be loaded and unloaded normally in a horizontal direction.

Ro–ro ship (roll-on/roll-off ship) means a ship which has one or more decks, either closed or open, not normally subdivided in any way and generally running the entire length of the ship, carrying goods which are normally loaded and unloaded in a horizontal direction.

Routine maintenance of IBCs (see *Intermediate bulk containers (IBCs)*).

Salvage packagings are special packagings into which damaged, defective, leaking or non-conforming dangerous goods packages, or dangerous goods that have spilled or leaked, are placed for purposes of transport for recovery or disposal.

Salvage pressure receptacle means a pressure receptacle with a water capacity not exceeding 1 000 litres into which are placed damaged, defective, leaking or non conforming pressure receptacle(s) for the purpose of transport, e.g., for recovery or disposal.

Self-accelerating decomposition temperature (SADT) means the lowest temperature at which self-accelerating decomposition may occur for a substance in the packaging as used in transport. The self-accelerating decomposition temperature (SADT) shall be determined in accordance with the latest version of the United Nations *Manual of Tests and Criteria*.

Semi-trailer means any trailer designed to be coupled to a motor vehicle in such a way that part of it rests on the motor vehicle and a substantial part of its mass and of the mass of its load is borne by the motor vehicle.

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

Shipborne barge or *barge* means an independent, non-self-propelled vessel, specially designed and equipped to be lifted in a loaded condition and stowed aboard a barge-carrying ship or barge feeder vessel.

Shipment means the specific movement of a consignment from origin to destination.

Shipper, for the purpose of this Code, has the same meaning as *consignor*.

Short international voyage means an international voyage in the course of which a ship is not more than 200 miles from a port or place in which the passengers and crew could be placed in safety. Neither the distance between the last port of call in the country in which the voyage begins and the final port of destination nor the return voyage shall exceed 600 miles. The final port of destination is the last port of call in the scheduled voyage at which the ship commences its return voyage to the country in which the voyage began.

Sift-proof packagings are packagings impermeable to dry contents, including fine solid material produced during transport.

Solid bulk cargo means any material, other than liquid or gas, consisting of a combination of particles, granules or any larger pieces of material, generally uniform in composition, which is loaded directly into the cargo spaces of a ship without any intermediate form of containment (this includes a material loaded in a barge on a barge-carrying ship).

Solids are dangerous goods, other than gases, that do not meet the definition of *liquids* in this chapter.

Special category space means an enclosed space, above or below deck, intended for the transport of motor vehicles with fuel in their tanks for their own propulsion, into and from which such vehicles can be driven and to which passengers have access.

Tank means a portable tank (including a tank-container), a road tank-vehicle, a rail tank-wagon or a receptacle to contain solids, liquids, or liquefied gases and has a capacity of not less than 450 litres when used for the transport of gases as defined in 2.2.1.1.

Test pressure means the required pressure applied during a pressure test for qualification or requalification (for portable tanks, see 6.7.2.1).

Through or into means through or into the countries in which a consignment is transported but specifically excludes countries "over" which a consignment is carried by air, provided that there are no scheduled stops in those countries.

Transboundary movement of wastes means any shipment of wastes from an area under the national jurisdiction of one country to or through an area under the national jurisdiction of another country, or to or through an area not under the national jurisdiction of any country, provided at least two countries are concerned by the movement.

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

Tubes are seamless transportable pressure receptacles of a water capacity exceeding 150 litres and of not more than 3000 litres.

Unit load means that a number of packages are either:

.1 placed or stacked on and secured by strapping, shrink-wrapping, or other suitable means to a load board, such as a pallet;

.2 placed in a protective outer enclosure, such as a pallet box;

.3 permanently secured together in a sling.

Vehicle means a road vehicle (including an articulated vehicle, i.e. a tractor and semi-trailer combination) or railroad car or railway wagon. Each trailer shall be considered as a separate vehicle.

Wastes means substances, solutions, mixtures, or articles containing or contaminated with one or more constituents which are subject to the provisions of this Code and for which no direct use is envisaged but which are transported for dumping, incineration, or other methods of disposal.

Water-reactive means a substance which, in contact with water, emits flammable gas.

Weather deck means a deck which is completely exposed to the weather from above and from at least two sides.

Wooden barrels means packagings made of natural wood, of round cross-section, having convex walls, consisting of staves and heads and fitted with hoops.

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

1.2.1.1 Clarifying examples for certain defined terms

The following explanations and examples are meant to assist in clarifying the use of some of the packaging terms defined in this chapter.

The definitions in this chapter are consistent with the use of the defined terms throughout the Code. However, some of the defined terms are commonly used in other ways. This is particularly evident in respect of the term "inner receptacle" which has often been used to describe the "inners" of a combination packaging.

The "inners" of "combination packagings" are always termed "inner packagings", not "inner receptacles". A glass bottle is an example of such an "inner packaging".

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".

1.2.2 Units of measurement

1.2.2.1 The following units of measurement* are applicable in this Code:

Measurement of:	SI unit[a]	Acceptable alternative unit	Relationship between units
Length	m (metre)	–	–
Area	m^2 (square metre)	–	–
Volume	m^3 (cubic metre)	ℓ[b] (litre)	1 ℓ $= 10^{-3}$ m^3
Time	s (second)	min (minute) h (hour) d (day)	1 min $= 60$ s 1 h $= 3600$ s 1 d $= 86400$ s
Mass	kg (kilogram)	g (gram) 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
Difference of temperature	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 bar $= 10^5$ Pa 1 Pa $= 1$ N/m^2
Stress	N/m^2	N/mm^2	1 N/mm^2 $= 1$ MPa
Work Energy Quantity of heat	J (joule)	kWh (kilowatt hour) eV (electronvolt)	1 kWh $= 3.6$ MJ 1 J $= 1$ N·m $= 1$ W·s 1 eV $= 0.1602 \times 10^{-18}$ 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)	–	–
Conductivity	S/m (siemens/metre)	–	–

[a] 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-92312 Sèvres).

[b] The abbreviation "L" for litre may also be used in place of the abbreviation "ℓ", when a typewriter/word-processor cannot distinguish between figure "1" and letter "ℓ".

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

Force	**Stress**		
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		
Pressure			
1 Pa = 1 N/m^2 = 10^{-5} bar	= 1.02×10^{-5} kg/cm^2	= 0.75×10^{-2} torr	
1 bar = 10^5 Pa	= 1.02 kg/cm^2	= 750 torr	
1 kg/cm^2 = 9.807×10^4 Pa	= 0.9807 bar	= 736 torr	
1 torr = 1.33×10^2 Pa	= 1.33×10^{-3} bar	= 1.36×10^{-3} kg/cm^2	
Energy, work, quantity of heat			
1 J = 1 N·m	= 0.278×10^{-6} kWh	= 0.102 kg·m	= 0.239×10^{-3} kcal
1 kWh = 3.6×10^6 J	= 367×10^3 kg·m	= 860 kcal	
1 kg·m = 9.807 J	= 2.72×10^{-6} kWh	= 2.34×10^{-3} kcal	
1 kcal = 4.19×10^3 J	= 1.16×10^{-3} kWh	= 427 kg·m	
Power		**Kinematic viscosity**	
1 W = 0.102 kg·m/s	= 0.86 kcal/h	1 m^2/s = 10^4 St (stokes)	
1 kg·m/s = 9.807 W	= 8.43 kcal/h	1 St = 10^{-4} m^2/s	
1 kcal/h = 1.16 W	= 0.119 kg·m/s		
Dynamic viscosity			
1 Pa·s = 1 N·s/m^2	= 10 P (poise)	= 0.102 kg·s/m^2	
1 P = 0.1 Pa·s	= 0.1 N·s/m^2	= 1.02×10^{-2} kg·s/m^2	
1 kg·s/m^2 = 9.807 Pa·s	= 9.807 N·s/m^2	= 98.07 P	

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:

Multiplying factor				Prefix	Symbol
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: 10^9 = 1 billion is United Nations usage in English. By analogy, so is 10^{-9} = 1 billionth.

1.2.2.2 [Reserved]

1.2.2.3 Whenever the mass of a package is mentioned, the gross mass is meant unless otherwise stated. The mass of containers or tanks used for the transport of goods is not included in the gross mass.

1.2.2.4 Unless expressly stated otherwise, the sign "%" represents:

.1 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;

.2 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;

.3 in the case of mixtures of liquefied gases and gases dissolved under pressure: the proportion of the mass indicated as a percentage of the total mass of the mixture.

1.2.2.5 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.

1.2.2.6 Tables of equivalence

1.2.2.6.1 *Mass conversion tables*

1.2.2.6.1.1 *Conversion factors*

Multiply	*by*	*to obtain*
Grams	0.03527	Ounces
Grams	0.002205	Pounds
Kilograms	35.2736	Ounces
Kilograms	2.2046	Pounds
Ounces	28.3495	Grams
Pounds	16	Ounces
Pounds	453.59	Grams
Pounds	0.45359	Kilograms
Hundredweight	112	Pounds
Hundredweight	50.802	Kilograms

1.2.2.6.1.2 *Pounds to kilograms and vice versa*

When the central value in any row of these mass conversion tables is taken to be in pounds, its equivalent value in kilograms is shown on the left; when the central value is in kilograms, its equivalent in pounds is shown on the right.

kg	← lb	→ kg	lb	kg	← lb	→ kg	lb	kg	← lb	→ kg	lb
0.227	0.5		1.10	22.7	50		110	90.7	200		441
0.454	1		2.20	24.9	55		121	95.3	210		463
0.907	2		4.41	27.2	60		132	99.8	220		485
1.36	3		6.61	29.5	65		143	102	225		496
1.81	4		8.82	31.8	70		154	104	230		507
2.27	5		11.0	34.0	75		165	109	240		529
2.72	6		13.2	36.3	80		176	113	250		551
3.18	7		15.4	38.6	85		187	118	260		573
3.63	8		17.6	40.8	90		198	122	270		595
4.08	9		19.8	43.1	95		209	125	275		606
4.54	10		22.0	45.4	100		220	127	280		617
4.99	11		24.3	47.6	105		231	132	290		639
5.44	12		26.5	49.9	110		243	136	300		661
5.90	13		28.7	52.2	115		254	159	350		772
6.35	14		30.9	54.4	120		265	181	400		882
6.80	15		33.1	56.7	125		276	204	450		992
7.26	16		35.3	59.0	130		287	227	500		1102
7.71	17		37.5	61.2	135		298	247	545		1202
8.16	18		39.7	63.5	140		309	249	550		1213
8.62	19		41.9	65.8	145		320	272	600		1323
9.07	20		44.1	68.0	150		331	318	700		1543
11.3	25		55.1	72.6	160		353	363	800		1764
13.6	30		66.1	77.1	170		375	408	900		1984
15.9	35		77.2	79.4	175		386	454	1000		2205
18.1	40		88.2	81.6	180		397				
20.4	45		99.2	86.2	190		419				

1.2.2.6.2 *Liquid measure conversion tables*

1.2.2.6.2.1 *Conversion factors*

Multiply	*by*	*to obtain*
Litres	0.2199	Imperial gallons
Litres	1.759	Imperial pints
Litres	0.2643	US gallons
Litres	2.113	US pints
Gallons	8	Pints
Imperial gallons	4.546	Litres
Imperial gallons Imperial pints	1.20095	US gallons US pints
Imperial pints	0.568	Litres
US gallons	3.7853	Litres
US gallons US pints	0.83268	Imperial gallons Imperial pints
US pints	0.473	Litres

1.2.2.6.2.2 *Imperial pints to litres and vice versa*

When the central value in any row of these liquid measure conversion tables is taken to be in pints, its equivalent value in litres is shown on the left; when the central value is in litres, its equivalent in pints is shown on the right.

ℓ	← pt →	ℓ	pt
0.28	0.5		0.88
0.57	1		1.76
0.85	1.5		2.64
1.14	2		3.52
1.42	2.5		4.40
1.70	3		5.28
1.99	3.5		6.16
2.27	4		7.04
2.56	4.5		7.92
2.84	5		8.80
3.12	5.5		9.68
3.41	6		10.56
3.69	6.5		11.44
3.98	7		12.32
4.26	7.5		13.20
4.55	8		14.08

1.2.2.6.2.3 *Imperial gallons to litres and vice versa*

When the central value in any row of these liquid measure conversion tables is taken to be in gallons, its equivalent value in litres is shown on the left; when the central value is in litres, its equivalent in gallons is shown on the right.

ℓ	← gal	→ ℓ	gal	ℓ	← gal	→ ℓ	gal
2.27	0.5		0.11	159.11	35		7.70
4.55	1		0.22	163.65	36		7.92
9.09	2		0.44	168.20	37		8.14
13.64	3		0.66	172.75	38		8.36
18.18	4		0.88	177.29	39		8.58
22.73	5		1.10	181.84	40		8.80
27.28	6		1.32	186.38	41		9.02
31.82	7		1.54	190.93	42		9.24
36.37	8		1.76	195.48	43		9.46
40.91	9		1.98	200.02	44		9.68
45.46	10		2.20	204.57	45		9.90
50.01	11		2.42	209.11	46		10.12
54.55	12		2.64	213.66	47		10.34
59.10	13		2.86	218.21	48		10.56
63.64	14		3.08	222.75	49		10.78
68.19	15		3.30	227.30	50		11.00
72.74	16		3.52	250.03	55		12.09
77.28	17		3.74	272.76	60		13.20
81.83	18		3.96	295.49	65		14.29
86.37	19		4.18	318.22	70		15.40
90.92	20		4.40	340.95	75		16.49
95.47	21		4.62	363.68	80		17.60
100.01	22		4.84	386.41	85		18.69
104.56	23		5.06	409.14	90		19.80
109.10	24		5.28	431.87	95		20.89
113.65	25		5.50	454.60	100		22.00
118.19	26		5.72	613.71	135		29.69
122.74	27		5.94	681.90	150		32.98
127.29	28		6.16	909.20	200		43.99
131.83	29		6.38	1022.85	225		49.48
136.38	30		6.60	1136.50	250		54.97
140.92	31		6.82	1363.80	300		65.99
145.47	32		7.04	1591.10	350		76.96
150.02	33		7.26	1818.40	400		87.99
154.56	34		7.48	2045.70	450		98.95

1.2.2.6.3 *Temperature conversion tables*

Degrees *Fahrenheit to degrees Celsius and vice versa*

When the central value in any row of these temperature conversion tables is taken to be in °F, its equivalent value in °C is shown on the left; when the central value is in °C, its equivalent in °F is shown on the right.

General formula: $°F = (°C \times \frac{9}{5}) + 32$; $°C = (°F - 32) \times \frac{5}{9}$

°C	← °F	°C →	°F	°C	← °F	°C →	°F	°C	← °F	°C →	°F
–73.3	–100		–148	–21.1	–6		21.2	1.1	34		93.2
–67.8	–90		–130	–20.6	–5		23.0	1.7	35		95
–62.2	–80		–112	–20.0	–4		24.8	2.2	36		96.8
–56.7	–70		–94	–19.4	–3		26.6	2.8	37		98.6
–51.1	–60		–76	–18.9	–2		28.4	3.3	38		100.4
–45.6	–50		–58	–18.3	–1		30.2	3.9	39		102.2
–40	–40		–40	–17.8	0		32.0	4.4	40		104
–39.4	–39		–38.2	–17.2	1		33.8	5	41		105.8
–38.9	–38		–36.4	–16.7	2		35.6	5.6	42		107.6
–38.3	–37		–34.6	–16.1	3		37.4	6.1	43		109.4
–37.8	–36		–32.8	–15.6	4		39.2	6.7	44		111.2
–37.2	–35		–31	–15.0	5		41.0	7.2	45		113
–36.7	–34		–29.2	–14.4	6		42.8	7.8	46		114.8
–36.1	–33		–27.4	–13.9	7		44.6	8.3	47		116.6
–35.6	–32		–25.6	–13.3	8		46.4	8.9	48		118.4
–35	–31		–23.8	–12.8	9		48.2	9.4	49		120.2
–34.4	–30		–22	–12.2	10		50.0	10.0	50		122.0
–33.9	–29		–20.2	–11.7	11		51.8	10.6	51		123.8
–33.3	–28		–18.4	–11.1	12		53.6	11.1	52		125.6
–32.8	–27		–16.6	–10.6	13		55.4	11.7	53		127.4
–32.2	–26		–14.8	–10.0	14		57.2	12.2	54		129.2
–31.7	–25		–13	–9.4	15		59.0	12.8	55		131.0
–31.1	–24		–11.2	–8.9	16		60.8	13.3	56		132.8
–30.6	–23		–9.4	–8.3	17		62.6	13.9	57		134.6
–30	–22		–7.6	–7.8	18		64.4	14.4	58		136.4
–29.4	–21		–5.8	–7.2	19		66.2	15.0	59		138.2
–28.9	–20		–4	–6.7	20		68	15.6	60		140.0
–28.3	–19		–2.2	–6.1	21		69.8	16.1	61		141.8
–27.8	–18		–0.4	–5.6	22		71.6	16.7	62		143.6
–27.2	–17		1.4	–5	23		73.4	17.2	63		145.4
–26.7	–16		3.2	–4.4	24		75.2	17.8	64		147.2
–26.1	–15		5	–3.9	25		77	18.3	65		149.0
–25.6	–14		6.8	–3.3	26		78.8	18.9	66		150.8
–25.0	–13		8.6	–2.8	27		80.6	19.4	67		152.6
–24.4	–12		10.4	–2.2	28		82.4	20.0	68		154.4
–23.9	–11		12.2	–1.7	29		84.2	20.6	69		156.2
–23.3	–10		14.0	–1.1	30		86	21.1	70		158.0
–22.8	–9		15.8	–0.6	31		87.8	21.7	71		159.8
–22.2	–8		17.6	0	32		89.6	22.2	72		161.6
–21.7	–7		19.4	0.6	33		91.4	22.8	73		163.4

°C	← °F	°C →	°F	°C	← °F	°C →	°F	°C	← °F	°C →	°F
23.3	74		165.2	37.8	100		212	52.2	126		258.8
23.9	75		167.0	38.3	101		213.8	52.8	127		260.6
24.4	76		168.8	38.9	102		215.6	53.3	128		262.4
25.0	77		170.6	39.4	103		217.4	53.9	129		264.2
25.6	78		172.4	40	104		219.2	54.4	130		266.0
26.1	79		174.2	40.6	105		221	55.0	131		267.8
26.7	80		176.0	41.1	106		222.8	55.6	132		269.6
27.2	81		177.8	41.7	107		224.6	56.1	133		271.4
27.8	82		179.6	42.2	108		226.4	56.7	134		273.2
28.3	83		181.4	42.8	109		228.2	57.2	135		275.0
28.9	84		183.2	43.3	110		230	57.8	136		276.8
29.4	85		185	43.9	111		231.8	58.3	137		278.6
30	86		186.8	44.4	112		233.6	58.9	138		280.4
30.6	87		188.6	45	113		235.4	59.4	139		282.2
31.1	88		190.4	45.6	114		237.2	60.0	140		284.0
31.7	89		192.2	46.1	115		239.0	65.6	150		302.0
32.2	90		194	46.7	116		240.8	71.1	160		320.0
32.8	91		195.8	47.2	117		242.6	76.7	170		338.0
33.3	92		197.6	47.8	118		244.4	82.2	180		356.0
33.9	93		199.4	48.3	119		246.2	87.8	190		374.0
34.4	94		201.2	48.9	120		248.0	93.3	200		392.0
35	95		203	49.4	121		249.8	98.9	210		410.0
35.6	96		204.8	50.0	122		251.6	104.4	220		428.0
36.1	97		206.6	50.6	123		253.4	110.0	230		446.0
36.7	98		208.4	51.1	124		255.2	115.6	240		464.0
37.2	99		210.2	51.7	125		257.0	121.1	250		482.0

1.2.3 List of abbreviations

ASTM	American Society for Testing and Materials (ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA, 19428-2959, United States of America)
CGA	Compressed Gas Association (CGA, 4221 Walney Road, 5th Floor, Chantilly VA 20151-2923, United States of America)
CSC	International Convention for Safe Containers, 1972, as amended
DSC	IMO Sub-Committee on Dangerous Goods, Solid Cargoes and Containers
ECOSOC	Economic and Social Council (UN)
EmS	The EmS Guide: Emergency Response procedures for Ships Carrying Dangerous Goods
EN (standard)	European standard published by the European Committee for Standardization (CEN) (CEN, 36 rue de Stassart, B-1050 Brussels, Belgium)
FAO	Food and Agriculture Organization (FAO; Viale delle Terme di Caracalla, 00100 Rome, Italy)
HNS Convention	International Convention on Liability and Compensation for Damage in Connection with the Transport of Hazardous and Noxious Substances (IMO)
IAEA	International Atomic Energy Agency (IAEA, P.O. Box 100, A – 1400 Vienna, Austria)
ICAO	International Civil Aviation Organization (ICAO, 999 University Street, Montreal, Quebec H3C 5H7, Canada)
IEC	International Electrotechnical Commission (IEC, 3 rue de Varembé, P.O. Box 131, CH-1211 Geneva 20, Switzerland)
ILO	International Labour Organization/Office (ILO, 4 route des Morillons, CH-1211 Geneva 22, Switzerland)

IMGS	International Medical Guide for Ships
IMO	International Maritime Organization (IMO, 4 Albert Embankment, London SE1 7SR, United Kingdom)
IMDG Code	International Maritime Dangerous Goods Code
IMSBC Code	International Maritime Solid Bulk Cargoes Code
INF Code	International Code for the Safe Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes on board Ships
ISO (standard)	An international standard published by the International Organization for Standardization (ISO, 1, ch. de la Voie-Creuse, CH-1211 Geneva 20, Switzerland)
MARPOL 73/78	International Convention for the Prevention of Pollution from Ships, 1973/78, as amended
MAWP	Maximum allowable working pressure
MEPC	Marine Environment Protection Committee (IMO)
MFAG	Medical First Aid guide for use in Accidents Involving Dangerous Goods
MSC	Maritime Safety Committee (IMO)
N.O.S.	not otherwise specified
SADT	Self-accelerating decomposition temperature
SOLAS 74	International Convention for the Safety of Life at Sea, 1974, as amended
UNECE	United Nations Economic Commission for Europe (UNECE, Palais des Nations, 8–14 avenue de la Paix, CH-1211 Geneva 10, Switzerland)
UN Number	Four-digit United Nations Number is assigned to dangerous, hazardous and harmful substances, materials and articles most commonly transported
UNEP	United Nations Environment Programme (United Nations Avenue, Gigiri, PO Box 30552, 00100, Nairobi, Kenya)
UNESCO/IOC	UN Educational, Scientific and Cultural Organization/Intergovernmental Oceanographic Commission (UNESCO/IOC, 1 rue Miollis, 75732 Paris Cedex 15, France)
WHO	World Health Organization (Avenue Appia 20, CH-1211 Geneva 27, Switzerland)
WMO	World Meteorological Organization (WMO, 7bis, avenue de la Paix, Case postale No. 2300, CH-1211 Geneva 2, Switzerland)

Chapter 1.3

Training

1.3.0 Introductory note

The successful application of regulations concerning the transport of dangerous goods and the achievement of their objectives are greatly dependent on the appreciation by all persons concerned of the risks involved and on a detailed understanding of the regulations. This can only be achieved by properly planned and maintained initial and retraining programmes for all persons concerned with the transport of dangerous goods. The provisions of paragraphs 1.3.1.4 to 1.3.1.7 remain recommendatory (see 1.1.1.5).

1.3.1 Training of shore-side personnel

1.3.1.1 Shore-based personnel* engaged in the transport of dangerous goods intended to be transported by sea shall be trained in the contents of dangerous goods provisions commensurate with their responsibilities. Employees shall be trained in accordance with the provisions of 1.3.1 before assuming responsibilities and shall only perform functions, for which required training has not yet been provided, under the direct supervision of a trained person. Training requirements specific to security of dangerous goods in chapter 1.4 shall also be addressed.

Entities engaging shore-based personnel in such activities shall determine which staff will be trained, what levels of training they require and the training methods used to enable them to comply with the provisions of the IMDG Code. This training shall be provided or verified upon employment in a position involving dangerous goods transport. For personnel who have not yet received the required training, the entities shall ensure that those personnel may only perform functions under the direct supervision of a trained person. The training shall be periodically supplemented with refresher training to take account of changes in regulations and practice. The competent authority, or its authorized body, may audit the entity to verify the effectiveness of the system in place, in providing training of staff commensurate with their role and responsibilities in the transport chain.

1.3.1.2 Shore-based personnel such as those who:

- classify dangerous goods and identify Proper Shipping Names of dangerous goods;
- pack dangerous goods;
- mark, label or placard dangerous goods;
- load/unload Cargo Transport Units;
- prepare transport documents for dangerous goods;
- offer dangerous goods for transport;
- accept dangerous goods for transport;
- handle dangerous goods in transport;
- prepare dangerous goods loading/stowage plans;
- load/unload dangerous goods into/from ships;
- carry dangerous goods in transport;
- enforce or survey or inspect for compliance with applicable rules and regulations; or
- are otherwise involved in the transport of dangerous goods as determined by the competent authority

shall be trained in the following:

1.3.1.2.1 *General awareness/familiarization training:*

.1 each person shall be trained in order to be familiar with the general provisions of dangerous goods transport provisions;

* For the training of officers and ratings responsible for cargo handling on ships carrying dangerous and hazardous substances in solid form in bulk, or in packaged form, see the STCW Code, as amended.

.2 such training shall include a description of the classes of dangerous goods; labelling, marking, placarding, packing, stowage, segregation and compatibility provisions; a description of the purpose and content of the dangerous goods transport documents (such as the Multimodal Dangerous Goods Form and the Container/Vehicle Packing Certificate); and a description of available emergency response documents.

1.3.1.2.2 *Function-specific training:* Each person shall be trained in specific dangerous goods transport provisions which are applicable to the function that person performs. An indicative list, for guidance purposes only, of some of the functions typically found in dangerous goods transport operations by sea and training requirements is given in paragraph 1.3.1.6.

1.3.1.3 Records of training received according to this chapter shall be kept by the employer and made available to the employee or competent authority, upon request. Records shall be kept by the employer for a period of time established by the competent authority.

1.3.1.4 *Safety training*: Commensurate with the risk of exposure in the event of a release and the functions performed, each person should be trained in:

.1 methods and procedures for accident avoidance, such as proper use of package-handling equipment and appropriate methods of stowage of dangerous goods;

.2 available emergency response information and how to use it;

.3 general dangers presented by the various classes of dangerous goods and how to prevent exposure to those hazards, including, if appropriate, the use of personal protective clothing and equipment; and

.4 immediate procedures to be followed in the event of an unintentional release of dangerous goods, including any emergency response procedures for which the person is responsible and personal protection procedures to be followed.

1.3.1.5 **Recommended training needs for shore-side personnel involved in the transport of dangerous goods under the IMDG Code**

The following indicative table is for information purposes only as every entity is arranged differently and may have varied roles and responsibilities within that entity.

Function	Specific training requirements	Numbers in this column refer to the list of related codes and publications in 1.3.1.7
1 Classify dangerous goods and identify Proper Shipping Name	Classification requirements, in particular – the structure of the description of substances – the classes of dangerous goods and the principles of their classification – the nature of the dangerous substances and articles transported (their physical, chemical and toxicological properties) – the procedure for classifying solutions and mixtures – identification by Proper Shipping Name – use of Dangerous Goods List	.1, .4, .5 and .12
2 Pack dangerous goods	Classes Packaging requirements – type of packages (IBC, large packaging, tank container and bulk container) – UN marking for approved packagings – segregation requirements – limited quantities and excepted quantities Marking and labelling First aid measures Emergency response procedures Safe handling procedures	.1 and .4
3 Mark, label or placard dangerous goods	Classes Marking, labelling and placarding requirements – primary and subsidiary risk labels – marine pollutants – limited quantities and excepted quantities	.1

Function	Specific training requirements	Numbers in this column refer to the list of related codes and publications in 1.3.1.7
4 Load/unload cargo transport units	Documentation Classes Marking, labelling and placarding Stowage requirements, where applicable Segregation requirements Cargo securing requirements (as contained in the IMO/ILO/UNECE Guidelines) Emergency response procedures First aid measures CSC requirements Safe handling procedures	.1, .6, .7 and .8
5 Prepare transport documents for dangerous goods	Documentation requirements – transport document – container/vehicle packing certificate – competent authorities' approval – waste transport documentation – special documentation, where appropriate	.1
6 Offer dangerous goods for transport	Thorough knowledge of the IMDG Code Local requirements at loading and discharge ports – port byelaws – national transport regulations	.1 to .10 and .12
7 Accept dangerous goods for transport	Thorough knowledge of the IMDG Code Local requirements at loading, transiting and discharge ports – port byelaws, in particular quantity limitations – national transport regulations	.1 to .12
8 Handle dangerous goods in transport	Classes and their hazards Marking, labelling and placarding Emergency response procedures First aid measures Safe handling procedures such as – use of equipment – appropriate tools – safe working loads CSC requirements, local requirements at loading, transit and discharge ports Port byelaws, in particular, quantity limitation National transport regulations	.1, .2, .3, .6, .7, .8 and .10
9 Prepare dangerous goods loading/ stowage plans	Documentation Classes Stowage requirements Segregation requirements Document of compliance Relevant IMDG Code parts, local requirements at loading, transit and discharge ports Port byelaws, in particular, quantity limitations	.1, .10, .11 and .12
10 Load/unload dangerous goods into/ from ships	Classes and their hazards Marking, labelling and placarding Emergency response procedures First aid measures Safe handling procedures such as – use of equipment – appropriate tools – safe working loads Cargo securing requirements CSC requirements, local requirements at loading, transit and discharge ports Port byelaws, in particular, quantity limitation National transport regulations	.1, .2, .3, .7, .9, .10 and .12

Function	Specific training requirements	Numbers in this column refer to the list of related codes and publications in 1.3.1.7
11 Carry dangerous goods	Documentation Classes Marking, labelling and placarding Stowage requirements, where applicable Segregation requirements Local requirements at loading, transit and discharge ports – port byelaws, in particular, quantity limitations – national transport regulations Cargo securing requirements (as contained in the IMO/ILO/UNECE Guidelines) Emergency response procedures First aid measures CSC requirements Safe handling procedures	.1, .2, .3, .6, .7, .10, .11 and .12
12 Enforce or survey or inspect for compliance with applicable rules and regulations	Knowledge of IMDG Code and relevant guidelines and safety procedures	.1 to .13
13 Are otherwise involved in the transport of dangerous goods, as determined by the competent authority	As required by the competent authority commensurate with the task assigned	–

1.3.1.6 Indicative table describing sections of the IMDG Code or other relevant instruments that may be appropriate to be considered in any training for the transport of dangerous goods

Function		IMDG Code part / section																SOLAS chapter II-2/19	Port byelaws	National transport regulations	CSC	Guidelines for packing of cargo transport units	Emergency response procedures	First aid measures	Safe handling procedures
		1	2	2.0	3	4	5	6	6*	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9								
1	Classify	X	X		X		X											X								
2	Pack	X		X	X	X	X	X			X	X						X						X	X	X
3	Mark, label, placard			X	X		X																			
4	Load/unload cargo transport units	X		X	X	X	X		X		X	X										X	X	X	X	X
5	Prepare transport documents	X		X	X		X											X						X	X	
6	Offer for transport	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	
7	Accept for transport	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8	Handle in transport	X		X	X		X		X			X								X	X	X		X	X	X
9	Prepare loading/ stowage plans	X		X	X	X	X			X	X	X	X	X	X	X	X	X	X	X				X		
10	Load/unload from ships	X	X		X		X					X			X			X		X		X	X	X	X	X
11	Carry	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Remarks:

* Only sections 6.1.2, 6.1.3, 6.5.2, 6.6.3, 6.7.2.20, 6.7.3.16 and 6.7.4.15 apply

1.3.1.7 Related Codes and publications which may be appropriate for function-specific training

.1 International Maritime Dangerous Goods (IMDG) Code, as amended

.2 The EmS Guide: Emergency Response Procedures for Ships Carrying Dangerous Goods (EmS), as amended

.3 Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG), as amended

.4 United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations, as amended

.5 United Nations Recommendations on the Transport of Dangerous Goods – Manual of Tests and Criteria, as amended

.6 IMO/ILO/UNECE Guidelines for Packing of Cargo Transport Units (CTUs)

.7 Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas

.8 International Convention for Safe Containers (CSC), 1972, as amended

.9 Code of Safe Practice for Cargo Stowage and Securing (CSS Code), as amended

.10 MSC.1/Circ.1265 Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo transport units*

.11 International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended

.12 International Convention for the Prevention of Pollution from Ships 1973 as modified by the Protocol of 1978 (MARPOL 73/78), as amended.

.13 MSC.1/Circ.[…] Inspection programmes for cargo transport units carrying dangerous goods.

* At its eighty-seventh session, in May 2010, the Maritime Safety Committee of the IMO approved Revised Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo transport units (MSC.1/Circ.1361), which supersedes MSC.1/Circ.1265.

Chapter 1.4

Security provisions

1.4.0 Scope

1.4.0.1 The provisions of this chapter address the security of dangerous goods in transport by sea. National competent authorities may apply additional security provisions, which should be considered when offering or transporting dangerous goods. The provisions of this chapter remain recommendatory except 1.4.1.1 (see 1.1.1.5).

1.4.0.2 The provisions of 1.4.2 and 1.4.3 do not apply to:

.1 UN 2908 and UN 2909 excepted packages;

.2 UN 2910 and UN 2911 excepted packages with an activity level not exceeding the A2 value; and

.3 UN 2912 LSA-I and UN 2913 SCO-I.

1.4.1 General provisions for companies, ships and port facilities*

1.4.1.1 The relevant provisions of chapter XI-2 of SOLAS 74, as amended, and of part A of the International Ship and Port Facility Security (ISPS) Code apply to companies, ships and port facilities engaged in the transport of dangerous goods and to which regulation XI-2 of SOLAS 74, as amended, apply taking into account the guidance given in part B of the ISPS Code.

1.4.1.2 For cargo ships of less than 500 gross tons engaged in the transport of dangerous goods, it is recommended that Contracting Governments to SOLAS 74, as amended, consider security provisions for these cargo ships.

1.4.1.3 Any shore-based company personnel, ship-based personnel and port facility personnel engaged in the transport of dangerous goods should be aware of the security requirements for such goods, in addition to those specified in the ISPS Code, and commensurate with their responsibilities.

1.4.1.4 The training of the company security officer, shore-based company personnel having specific security duties, port facility security officer and port facility personnel having specific duties, engaged in the transport of dangerous goods, should also include elements of security awareness related to those goods.

1.4.1.5 All shipboard personnel and port facility personnel who are not mentioned in 1.4.1.4 and are engaged in thetransport of dangerous goods should be familiar with the provisions of the relevant security plans related to those goods, commensurate with their responsibilities.

1.4.2 General provisions for shore-side personnel

1.4.2.1 For the purpose of this subsection, shore-side personnel covers individuals mentioned in 1.3.1.2. However, the provisions of 1.4.2 do not apply to:

- the company security officer and appropriate shore-based company personnel mentioned in 13.1 of part A of the ISPS Code,
- the ship security officer and the shipboard personnel mentioned in 13.2 and 13.3 of part A of the ISPS Code,
- the port facility security officer, the appropriate port facility security personnel and the port facility Personnel having specific security duties mentioned in 18.1 and 18.2 of part A of the ISPS Code.

For the training of those officers and personnel, refer to the International Ship and Port Facility Security (ISPS) Code.

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* Refer to MSC.1/Circ.1341 on Guidelines on security-related training and familiarization for port facility personnel and to MSC.1/Circ.1188 on Guidelines on training and certification for port facility security officers.

1.4.2.2 Shore-side personnel engaged in transport by sea of dangerous goods should consider security provisions for the transport of dangerous goods commensurate with their responsibilities.

1.4.2.3 Security training

1.4.2.3.1 The training of shore-side personnel, as specified in chapter 1.3, shall also include elements of security awareness.

1.4.2.3.2 Security awareness training should address the nature of security risks, recognizing security risks, methods to address and reduce risks and actions to be taken in the event of a security breach. It should include awareness of security plans (if appropriate, refer to 1.4.3) commensurate with the responsibilities of individuals and their part in implementing security plans.

1.4.2.3.3 Such training should be provided or verified upon employment in a position involving dangerous goods transport and should be periodically supplemented with retraining.

1.4.2.3.4 Records of all security training received should be kept by the employer and made available to the employee or competent authority, upon request. Records should be kept by the employer for a period of time established by the competent authority.

1.4.3 Provisions for high consequence dangerous goods

1.4.3.1 Definition of high consequence dangerous goods

1.4.3.1.1 High consequence dangerous goods are those which have the potential for misuse in a terrorist event and which may, as a result, produce serious consequences such as mass casualties, mass destruction or, particularly for Class 7, mass socio-economic disruption.

1.4.3.1.2 An indicative list of high consequence dangerous goods in classes and divisions other than Class 7 is given in Table 1.4.1 below.

Table 1.4.1 : Indicative list of high consequence dangerous goods

Class 1, Division 1.1	explosives
Class 1, Division 1.2	explosives
Class 1, Division 1.3	compatibility group C explosives
Class 1, Division 1.4	UN Nos. 0104, 0237, 0255, 0267, 0289, 0361, 0365, 0366, 0440, 0441, 0455, 0456 and 0500
Class 1, Division 1.5	explosives
Class 2.1	Flammable gases in quantities greater than 3000 ℓ in a road tank vehicle, a railway tank wagon or a portable tank
Class 2.3	Toxic gases
Class 3	Flammable liquids of packing groups I and II in quantities greater than 3000 ℓ in a road tank vehicle, a railway tank wagon or a portable tank
Class 3	Desensitized liquid explosives
Class 4.1	Desensitized solid explosives
Class 4.2	Goods of packing group I in quantities greater than 3000 kg or 3000 ℓ in a road tank vehicle, a railway tank wagon, a portable tank or a bulk container
Class 4.3	Goods of packing group I in quantities greater than 3000 kg or 3000 ℓ in a road tank vehicle, a railway tank wagon, a portable tank or a bulk container
Class 5.1	Oxidizing liquids of packing group I in quantities greater than 3000 ℓ in a road tank vehicle, a railway tank wagon or a portable tank
Class 5.1	Perchlorates, ammonium nitrate, ammonium nitrate fertilizers and ammonium nitrate emulsions or suspensions or gels in quantities greater than 3000 kg or 3000 ℓ in a road tank vehicle, a railway tank wagon, a portable tank or a bulk container
Class 6.1	Toxic substances of packing group I
Class 6.2	Infectious substances of category A (UN Nos. 2814 and 2900)

Class 8 — Corrosive substances of packing group I in quantities greater than 3000 kg or 3000 ℓ in a road tank vehicle, a railway tank wagon, a portable tank or a bulk container

1.4.3.1.3 For dangerous goods of Class 7, high consequence radioactive material is that with an activity equal to or greater than a transport security threshold of 3 000 A_2 per single package (see also 2.7.2.2.1) except for the following radionuclides where the transport security threshold is given in Table 1.4.2 below.

Table 1.4.2 – Transport security thresholds for specific radionuclides

Element	Radionuclide	Transport security threshold (TBq)
Americium	Am-241	0.6
Gold	Au-198	2
Cadmium	Cd-109	200
Californium	Cf-252	0.2
Curium	Cm-244	0.5
Cobalt	Co-57	7
Cobalt	Co-60	0.3
Cesium	Cs-137	1
Iron	Fe-55	8000
Germanium	Ge-68	7
Gadolinium	Gd-153	10
Iridium	Ir-192	0.8
Nickel	Ni-63	600
Paladium	Pd-103	900
Promethium	Pm-147	400
Polonium	Po-210	0.6
Plutonium	Pu-238	0.6
Plutonium	Pu-239	0.6
Radium	Ra-226	0.4
Ruthenium	Ru-106	3
Selenium	Se-75	2
Strontium	Sr-90	10
Thallium	Tl-204	200
Thulium	Tm-170	200
Yterbium	Yb-169	3

1.4.3.1.4 For mixtures of radionuclides, determination of whether or not the transport security threshold has been met or exceeded can be calculated by summing the ratios of activity present for each radionuclide divided by the transport security threshold for that radionuclide. If the sum of the fractions is less than 1, then the radioactivity threshold for the mixture has not been met nor exceeded.

This calculation can be made with the formula:

$$\sum_i \frac{A_i}{T_i} < 1$$

Where:

A_i = activity of radionuclide *i* that is present in a package (TBq)

T_i = transport security threshold for radionuclide *i* (TBq).

1.4.3.1.5 When radioactive material possess subsidiary risks of other classes or divisions, the criteria of table 1.4.1 should also be taken into account (see also 1.5.5.1).

1.4.3.2 Specific security provisions for high consequence dangerous goods

1.4.3.2.1 The provisions of this section do not apply to ships and to port facilities (see the ISPS Code for ship security plan and for port facility security plan).

1.4.3.2.2 *Security plans*

1.4.3.2.2.1 Consignors and others engaged in the transport of high consequence dangerous goods (see 1.4.3.1) should adopt, implement and comply with a security plan that addresses at least the elements specified in 1.4.3.2.2.2.

1.4.3.2.2.2 The security plan should comprise at least the following elements:

.1 specific allocation of responsibilities for security to competent and qualified persons with appropriate authority to carry out their responsibilities;

.2 records of dangerous goods or types of dangerous goods transported;

.3 review of current operations and assessment of vulnerabilities, including intermodal transfer, temporary transit storage, handling and distribution, as appropriate;

.4 clear statements of measures, including training, policies (including 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 temporary storage, proximity to vulnerable infrastructure, etc.), equipment and resources that are to be used to reduce security risks;

.5 effective and up-to-date procedures for reporting and dealing with security threats, breaches of security or security-related incidents;

.6 procedures for the evaluation and testing of security plans and procedures for periodic review and update of the plans;

.7 measures to ensure the security of transport information contained in the plan; and

.8 measures to ensure that the distribution of transport information is limited as far as possible. (Such measures shall not preclude provision of transport documentation required by chapter 5.4 of this Code.)

1.4.3.2.3 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 the IAEA circular on The Physical Protection of Nuclear Material* and Nuclear Facilities† are applied.

* INFCIRC/274/Rev.1, IAEA, Vienna (1980).

† INFCIRC/225/Rev.4 (Corrected), IAEA, Vienna (1999).

Chapter 1.5

General provisions concerning class 7

1.5.1 Scope and application

1.5.1.1 The provisions of this Code establish 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 transport of radioactive material. These provisions are based on the IAEA Regulations for the Safe Transport of Radioactive Material (2009 Edition), Safety Standards Series No. TS-R-1, IAEA, Vienna (2009). Explanatory material can be found in "Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material" (2005 Edition), Safety Standard Series No. TS-G-1.1 (Rev.1), IAEA, Vienna (2008).

1.5.1.2 The objective of this Code is to establish provisions that shall be satisfied to ensure safety and to protect persons, property and the environment from the effects of radiation in the transport of radioactive material. This protection is achieved by requiring:

.1 Containment of the radioactive contents;

.2 Control of external radiation levels;

.3 Prevention of criticality; and

.4 Prevention of damage caused by heat.

These provisions are satisfied firstly by applying a graded approach to contents limits for packages and conveyances 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.

1.5.1.3 The provisions of this Code apply to the transport of radioactive material by sea, including transport which is incidental to the use of the radioactive material. Transport 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, transport 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 the provisions of this Code that are characterized by three general severity levels:

.1 Routine conditions of transport (incident-free);

.2 Normal conditions of transport (minor mishaps); and

.3 Accident conditions of transport.

1.5.1.4 The provisions of this Code shall not apply to:

.1 Radioactive material that is an integral part of the means of transport;

.2 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;

.3 Radioactive material implanted or incorporated into a person or live animal for diagnosis or treatment;

.4 Radioactive material in consumer products which have received regulatory approval, following their sale to the end user;

.5 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 2.7.2.2.1.2, or calculated in accordance with 2.7.2.2.2 to 2.7.2.2.6; and

.6 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 2.7.1.2.

1.5.1.5 Specific provisions for the transport of excepted packages

1.5.1.5.1 Excepted packages which may contain radioactive material in limited quantities, instruments, manufactured articles and empty packagings as specified in 2.7.2.4.1 shall be subject only to the following provisions of parts 5 to 7:

.1 The applicable provisions specified in 5.1.2, 5.1.3.2, 5.1.4, 5.1.5.4, 5.2.1.5.2, 5.2.1.7, 7.1.3.2, 7.6.2.1.8, 7.8.4.2;

.2 The provisions for excepted packages specified in 6.4.4; and

.3 If the excepted package contains fissile material, one of the fissile exceptions provided by 2.7.2.3.5 shall apply and the provision of 6.4.7.2 shall be met.

1.5.1.5.2 Excepted packages shall be subject to the relevant provisions of all other parts of this Code.

1.5.2 Radiation protection programme

1.5.2.1 The transport 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.

1.5.2.2 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 restrictions 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 transport and other activities.

1.5.2.3 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 provisions in 1.5.2.2, 1.5.2.4 and 7.1.4.5.13 to 7.1.4.5.18. Programme documents shall be available, on request, for inspection by the relevant competent authority.

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

.1 is likely to be between 1 and 6 mSv in a year, a dose assessment programme via workplace monitoring or individual monitoring shall be conducted;

.2 is likely to exceed 6 mSv in a year, individual monitoring shall be conducted.

When individual monitoring or workplace 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 1 mSv in a year, no special work patterns, detailed monitoring, dose assessment programmes or individual record keeping need be required.

1.5.3 Quality assurance

1.5.3.1 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 transport and in-transit storage operations to ensure compliance with the relevant provisions of this Code. 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:

.1 the manufacturing methods and materials used are in accordance with the approved design specifications; and

.2 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.

1.5.4 Special arrangement

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

1.5.4.2 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 this Code is impracticable and that the requisite standards of safety established by this Code 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 transport shall be at least equivalent to that which would be provided if all the applicable provisions had been met. For international consignments of this type, multilateral approval shall be required.

1.5.5 Radioactive material possessing other dangerous properties

1.5.5.1 In addition to the radioactive and fissile properties, any subsidiary risk of the contents of a 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 transport, in order to be in compliance with all relevant provisions for dangerous goods. (See also special provision 172 and, for excepted packages, special provision 290.)

1.5.6 Non-compliance

1.5.6.1 In the event of a non-compliance with any limit in the provisions of this Code applicable to radiation level or contamination,

.1 The consignor shall be informed of the non-compliance

(i) by the carrier if the non-compliance is identified during transport; or

(ii) by the consignee if the non-compliance is identified at receipt;

.2 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 relevant competent authority(ies) on the causes of the non-compliance and on corrective or preventive actions taken or to be taken; and

.3 The communication of the non-compliance to the consignor and relevant 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.

PART 2

CLASSIFICATION

Chapter 2.0

Introduction

Note: For the purposes of this Code, it has been necessary to classify dangerous goods in different classes, to subdivide a number of these classes and to define and describe characteristics and properties of the substances, materials and articles which would fall within each class or division. Moreover, in accordance with the criteria for the selection of marine pollutants for the purposes of Annex III of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), a number of dangerous substances in the various classes have also been identified as substances harmful to the marine environment (MARINE POLLUTANTS).

2.0.0 Responsibilities

The classification shall be made by the shipper/consignor or by the appropriate competent authority where specified in this Code.

2.0.1 Classes, divisions, packing groups

2.0.1.1 Definitions

Substances (including mixtures and solutions) and articles subject to the provisions of this Code are assigned to one of the classes 1–9 according to the hazard or the most predominant of the hazards they present. Some of these classes are subdivided into divisions. These classes or divisions are as listed below:

Class 1: Explosives
- Division 1.1: substances and articles which have a mass explosion hazard
- 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
- Division 1.4: substances and articles which present no significant hazard
- Division 1.5: very insensitive substances which have a mass explosion hazard
- Division 1.6: extremely insensitive articles which do not have a mass explosion hazard

Class 2: Gases
- Class 2.1: flammable gases
- Class 2.2: non-flammable, non-toxic gases
- Class 2.3: toxic gases

Class 3: Flammable liquids

Class 4: Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases
- 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: Oxidizing substances and organic peroxides
- Class 5.1: oxidizing substances
- Class 5.2: organic peroxides

Class 6: Toxic and infectious substances
- 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

The numerical order of the classes and divisions is not that of the degree of danger.

2.0.1.2 **Marine pollutants**

2.0.1.2.1 Many of the substances assigned to classes 1 to 9 are deemed as being *marine pollutants* (see chapter 2.10).

2.0.1.2.2 Known marine pollutants are noted in the dangerous goods list and are indicated in the Index.

2.0.1.3 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 three 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; and

Packing group III: substances presenting low danger.

The packing group to which a substance is assigned is indicated in the Dangerous Goods List in chapter 3.2.

2.0.1.4 Dangerous goods are determined to present one or more of the dangers represented by classes 1 to 9, marine pollutants and, if applicable, the degree of danger (packing group) on the basis of the provisions in chapters 2.1 to 2.10.

2.0.1.5 Dangerous goods presenting a danger of a single class or division are assigned to that class or division and the packing group, if applicable, determined. When an article or substance is specifically listed by name in the Dangerous Goods List in chapter 3.2, its class or division, its subsidiary risk(s) and, when applicable, its packing group are taken from this list.

2.0.1.6 Dangerous goods meeting the defining criteria of more than one hazard class or division and which are not listed by name in the Dangerous Goods List are assigned to a class or division and subsidiary risk(s) on the basis of the precedence of hazard provisions prescribed in 2.0.3.

2.0.2 UN Numbers and Proper Shipping Names

2.0.2.1 Dangerous goods are assigned to UN Numbers and Proper Shipping Names according to their hazard classification and their composition.

2.0.2.2 Dangerous goods commonly transported are listed in the Dangerous Goods List in chapter 3.2. Where an article or substance is specifically listed by name, it shall be identified in transport by the Proper Shipping Name in the Dangerous Goods List. Such substances may contain technical impurities (for example those deriving from the production process) or additives for stability or other purposes that do not affect their classification. However, a substance listed by name containing technical impurities or additives for stability or other purposes affecting its classification shall be considered a mixture or solution (see 2.0.2.5). For dangerous goods not specifically listed by name, "generic" or "not otherwise specified" entries are provided (see 2.0.2.7) to identify the article or substance in transport.

Each entry in the Dangerous Goods List is assigned a UN Number. This list also contains relevant information for each entry, such as hazard class, subsidiary risk(s) (if any), packing group (where assigned), packing and tank transport provisions, EmS, segregation and stowage, properties and observations, etc.

Entries in the Dangerous Goods List are of the following four types:

.1 single entries for well-defined substances or articles:

e.g. UN 1090 acetone
UN 1194 ethyl nitrite solution

.2 generic entries for well-defined groups of substances or articles:

e.g. UN 1133 adhesives
UN 1266 perfumery product
UN 2757 carbamate pesticide, solid, toxic
UN 3101 organic peroxide type B, liquid

.3 specific N.O.S. entries covering a group of substances or articles of a particular chemical or technical nature:

e.g. UN 1477 nitrates, inorganic, N.O.S.
UN 1987 alcohols, N.O.S.

.4 general N.O.S. entries covering a group of substances or articles meeting the criteria of one or more classes:

e.g. UN 1325 flammable solid, organic, N.O.S.
UN 1993 flammable liquid, N.O.S.

2.0.2.3 All self-reactive substances of class 4.1 are assigned to one of twenty generic entries in accordance with the classification principles described in 2.4.2.3.3.

2.0.2.4 All organic peroxides of class 5.2 are assigned to one of twenty generic entries in accordance with the classification principles described in 2.5.3.3.

2.0.2.5 A mixture or solution meeting the classification criteria of this Code composed of a single predominant substance identified by name in the Dangerous Goods List and one or more substances not subject to the provisions of this Code and/or traces of one or more substances identified by name in the Dangerous Goods List, shall be assigned the UN Number and Proper Shipping Name of the predominant substance named in the Dangerous Goods List unless:

.1 the mixture or solution is identified by name in the Dangerous Goods List;

.2 the name and description of the substance named in the Dangerous Goods List specifically indicate that they apply only to the pure substance;

.3 the hazard class or division, subsidiary risk(s), packing group, or physical state of the mixture or solution is different from that of the substance named in the Dangerous Goods List; or

.4 the hazard characteristics and properties of the mixture or solution necessitate emergency response measures that are different from those required for the substance identified by name in the Dangerous Goods List.

In those other cases, except the one described in .1, the mixture or solution shall be treated as a dangerous substance not specifically listed by name in the Dangerous Goods List.

2.0.2.6 When the class, physical state or packing group has changed in comparison with the pure substance, the solution or mixture shall be shipped in accordance with the provisions for the changed hazard under an appropriate N.O.S. entry.

2.0.2.7 Substances or articles which are not specifically listed by name in the Dangerous Goods List shall be classified under a "generic" or "not otherwise specified" (N.O.S.) Proper Shipping Name. The substance or article shall be classified according to the class definitions and test criteria in this part, and the article or substance classified under the generic or "N.O.S." Proper Shipping Name in the Dangerous Goods List which most appropriately describes the article or substance. This means that a substance is only to be assigned to an entry of type .3 – as defined in 2.0.2.2 – if it cannot be assigned to an entry of type .2, and to an entry of type .4 if it cannot be assigned to an entry of type .2 or .3.*

2.0.2.8 When considering a solution or mixture in accordance with 2.0.2.5, due account shall be given to whether the dangerous constituent comprising the solution or mixture has been identified as a marine pollutant. If this is the case, the provisions of chapter 2.10 are also applicable.

2.0.2.9 A mixture or solution, containing one or more substances identified by name in this Code or classified under an N.O.S. or generic entry and one or more substances not subject to the provisions of this Code, is not subject to the provisions of this Code if the hazard characteristics of the mixture or solution are such that they do not meet the criteria (including human experience criteria) for any class.

2.0.2.10 A mixture or solution meeting the classification criteria of this Code that is not identified by name in the Dangerous Goods List and that is composed of two or more dangerous goods shall be assigned to an entry that has the Proper Shipping Name, description, hazard class or division, subsidiary risk(s) and packing group that most precisely describe the mixture or solution.

2.0.3 Classification of substances, mixtures and solutions with multiple hazards (precedence of hazard characteristics)

2.0.3.1 The table of precedence of hazard characteristics in 2.0.3.6 shall be used to determine the class of a substance, mixture or solution having more than one hazard when it is not specifically listed by name in this Code. For substances, mixtures or solutions having multiple hazards which are not specifically listed by name, the most stringent packing group of those assigned to the respective hazards of the goods takes precedence over other packing groups, irrespective of the precedence of hazard table in 2.0.3.6.

2.0.3.2 The precedence of hazard table indicates which of the hazards shall be regarded as the primary hazard. The class which appears at the intersection of the horizontal line and the vertical column is the primary hazard and the remaining class is the subsidiary hazard. The packing groups for each of the hazards associated with the substance, mixture or solution shall be determined by reference to the appropriate criteria. The most stringent of the groups so indicated shall then become the packing group of the substance, mixture or solution.

2.0.3.3 The Proper Shipping Name (see 3.1.2) of a substance, mixture or solution when classified in accordance with 2.0.3.1 and 2.0.3.2 shall be the most appropriate N.O.S. ("not otherwise specified") entry in this Code for the class shown as the primary hazard.

2.0.3.4 The precedence of hazard characteristics of the following substances, materials and articles have not been dealt with in the precedence of hazard table, as these primary hazards always take precedence:

* See also the generic or N.O.S. Proper Shipping Name in appendix A.

.1 substances and articles of class 1;
.2 gases of class 2;
.3 liquid desensitized explosives of class 3;
.4 self-reactive substances and solid desensitized explosives of class 4.1;
.5 pyrophoric substances of class 4.2;
.6 substances of class 5.2;
.7 substances of class 6.1 with a packing group I vapour inhalation toxicity;
.8 substances of class 6.2; and
.9 materials of class 7.

2.0.3.5 Apart from excepted radioactive material (where the other hazardous properties take precedence), radioactive material having other hazardous properties shall always be classified in class 7, with the greatest of the additional hazards being identified. For radioactive material in excepted packages, special provision 290 of chapter 3.3 applies.

2.0.3.6 Precedence of hazards

Class and Packing Group	4.2	4.3	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 Liquid	8, I Solid	8, II Liquid	8, II Solid	8, III Liquid	8, III Solid
3 I*		4.3				3	3	3	3	3	–	3	–	3	–
3 II*		4.3				3	3	3	3	8	–	3	–	3	–
3 III*		4.3				6.1	6.1	6.1	3†	8	–	8	–	3	–
4.1 II*	4.2	4.3	5.1	4.1	4.1	6.1	6.1	4.1	4.1	–	8	–	4.1	–	4.1
4.1 III*	4.2	4.3	5.1	4.1	4.1	6.1	6.1	6.1	4.1	–	8	–	8	–	4.1
4.2 II		4.3	5.1	4.2	4.2	6.1	6.1	4.2	4.2	8	8	4.2	4.2	4.2	4.2
4.2 III		4.3	5.1	5.1	4.2	6.1	6.1	6.1	4.2	8	8	8	8	4.2	4.2
4.3 I			5.1	4.3	4.3	6.1	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
4.3 II			5.1	4.3	4.3	6.1	4.3	4.3	4.3	8	8	4.3	4.3	4.3	4.3
4.3 III			5.1	5.1	4.3	6.1	6.1	6.1	4.3	8	8	8	8	4.3	4.3
5.1 I						5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
5.1 II						6.1	5.1	5.1	5.1	8	8	5.1	5.1	5.1	5.1
5.1 III						6.1	6.1	6.1	5.1	8	8	8	8	5.1	5.1
6.1 I, Dermal										8	6.1	6.1	6.1	6.1	6.1
6.1 I, Oral										8	6.1	6.1	6.1	6.1	6.1
6.1 II, Inhalation										8	6.1	6.1	6.1	6.1	6.1
6.1 II, Dermal										8	6.1	8	6.1	6.1	6.1
6.1 II, Oral										8	8	8	6.1	6.1	6.1
6.1 III										8	8	8	8	8	8

* Substances of class 4.1 other than self-reactive substances and solid desensitized explosives and substances of class 3 other than liquid desensitized explosives.

† 6.1 for pesticides.

– Denotes an impossible combination.

For hazards not shown in this table, see 2.0.3.

2.0.4 Transport of samples

2.0.4.1 When the hazard class of a substance is uncertain and it is being transported for further testing, a tentative hazard class, Proper Shipping Name and identification number shall be assigned on the basis of the consignor's knowledge of the substances and application of:

.1 the classification criteria of this Code; and
.2 the precedence of hazards given in 2.0.3.

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" (such as 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 (such as UN 3167, GAS SAMPLE, NON-PRESSURIZED, FLAMMABLE), that Proper Shipping Name shall be used. When an N.O.S. entry is used to transport the sample, the Proper Shipping Name need not be supplemented with the technical name as required by special provision 274.

2.0.4.2 Samples of the substance shall be transported in accordance with the provisions applicable to the tentative assigned Proper Shipping Name provided:

.1 the substance is not considered to be a substance prohibited for transport by 1.1.3;

.2 the substance is not considered to meet the criteria for class 1 or considered to be an infectious substance or a radioactive material;

.3 the substance is in compliance with 2.4.2.3.2.4.2 or 2.5.3.2.5.1 if it is a self-reactive substance or an organic peroxide, respectively;

.4 the sample is transported in a combination packaging with a net mass per package not exceeding 2.5 kg; and

.5 the sample is not packed together with other goods.

2.0.5 Transport of wastes

2.0.5.1 Preamble

Wastes, which are dangerous goods, shall be transported in accordance with the relevant international recommendations and conventions and, in particular, where it concerns transport by sea, with the provisions of this Code.

2.0.5.2 Applicability

2.0.5.2.1 The provisions of this chapter are applicable to the transport of wastes by ships and shall be considered in conjunction with all other provisions of this Code.

2.0.5.2.2 Substances, solutions, mixtures or articles containing or contaminated with radioactive material are subject to the applicable provisions for radioactive material in class 7, and are not to be considered as wastes for the purposes of this chapter.

2.0.5.3 Transboundary movements under the Basel Convention*

2.0.5.3.1 Transboundary movement of wastes is permitted to commence only when:

.1 notification has been sent by the competent authority of the country of origin, or by the generator or exporter through the channel of the competent authority of the country of origin, to the country of final destination; and

.2 the competent authority of the country of origin, having received the written consent of the country of final destination stating that the wastes will be safely incinerated or treated by other methods of disposal, has given authorization to the movement.

2.0.5.3.2 In addition to the transport document required in chapter 5.4, all transboundary movements of wastes shall be accompanied by a waste movement document from the point at which a transboundary movement commences to the point of disposal. This document shall be available at all times to the competent authorities and to all persons involved in the management of waste transport operations.

2.0.5.3.3 The transport of solid wastes in bulk in cargo transport units and road vehicles is only permitted with the approval of the competent authority of the country of origin.

2.0.5.3.4 In the event that packages and cargo transport units containing wastes are suffering from leakage or spillage, the competent authorities of the countries of origin and destination shall be immediately informed and advice on the action to be taken obtained from them.

* Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)

2.0.5.4 Classification of wastes

2.0.5.4.1 A waste containing only one constituent which is a dangerous substance subject to the provisions of this Code shall be regarded as being that particular substance. If the concentration of the constituent is such that the waste continues to present a hazard inherent in the constituent itself, it shall be classified according to the criteria of the applicable classes.

2.0.5.4.2 A waste containing two or more constituents which are dangerous substances subject to the provisions of this Code shall be classified under the applicable class in accordance with their dangerous characteristics and properties as described in 2.0.5.4.3 and 2.0.5.4.4.

2.0.5.4.3 The classification according to the dangerous characteristics and properties shall be carried out as follows:

.1 determination of the physical and chemical characteristics and physiological properties by measurement or calculation followed by classification according to the criteria of the applicable class(es); or

.2 if the determination is not practicable, the waste shall be classified according to the constituent presenting the predominant hazard.

2.0.5.4.4 In determining the predominant hazard, the following criteria shall be taken into account:

.1 if one or more constituents fall within a certain class and the waste presents a hazard inherent in these constituents, the waste shall be included in that class; or

.2 if there are constituents falling under two or more classes, the classification of the waste shall take into account the order of precedence applicable to dangerous substances with multiple hazards set out in 2.0.3.

2.0.5.4.5 Wastes harmful to the marine environment only shall be transported under the class 9 entries for ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., UN 3082, or ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., UN 3077, with the addition of the word “WASTE”. However, this is not applicable to substances which are covered by individual entries in this Code.

2.0.5.4.6 Wastes not otherwise subject to the provisions of this Code but covered under the Basel Convention may be transported under the class 9 entries for ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., UN 3082 or ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., UN 3077.

Chapter 2.1

Class 1 – Explosives

2.1.0 Introductory notes (these notes are not mandatory)

Note 1: Class 1 is a restricted class, that is, only those explosive substances and articles that are listed in the Dangerous Goods List in chapter 3.2 may be accepted for transport. However, the competent authorities retain the right by mutual agreement to approve transport of explosive substances and articles for special purposes under special conditions. Therefore entries have been included in the Dangerous Goods List for "Substances, explosive, not otherwise specified" and "Articles, explosive, not otherwise specified". It is intended that these entries should only be used when no other method of operation is possible.

Note 2: General entries such as "Explosive, blasting, type A" are used to allow for the transport of new substances. In preparing these provisions, military ammunition and explosives have been taken into consideration to the extent that they are likely to be transported by commercial carriers.

Note 3: A number of substances and articles in class 1 are described in appendix B. These descriptions are given because a term may not be well-known or may be at variance with its usage for regulatory purposes.

Note 4: Class 1 is unique in that the type of packaging frequently has a decisive effect on the hazard and therefore on the assignment to a particular division. The correct division is determined by use of the procedures provided in this chapter.

2.1.1 Definitions and general provisions

2.1.1.1 Class 1 comprises:

.1 explosive substances (a substance which is not itself an explosive but which can form an explosive atmosphere of gas, vapour or dust is not included in class 1), except those which are too dangerous to transport or those where the predominant hazard is one appropriate to another class;

.2 explosive articles, except devices containing explosive substances in such quantity or of such a character that their inadvertent or accidental ignition or initiation during transport shall not cause any effect external to the device either by projection, fire, smoke, heat or loud noise (see 2.1.3.4); and

.3 substances and articles not mentioned under .1 and .2 which are manufactured with a view to producing a practical, explosive or pyrotechnic effect.

2.1.1.2 Transport of explosive substances which are unduly sensitive, or so reactive as to be subject to spontaneous reaction, is prohibited.

2.1.1.3 Definitions

For the purposes of this Code, the following definitions apply:

.1 *Explosive substance* means a solid or liquid substance (or a mixture of substances) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic substances are included even when they do not evolve gases.

.2 *Pyrotechnic substance* means a substance or a mixture of substances designed to produce an effect by heat, light, sound, gas or smoke or a combination of these as the result of non-detonative self-sustaining exothermic chemical reactions.

.3 *Explosive article* means an article containing one or more explosive substances.

.4 *Mass explosion* means one which affects almost the entire load virtually instantaneously.

.5 *Phlegmatized* means that a substance (or "phlegmatizer") has been added to an explosive to enhance its safety in handling and transport. The phlegmatizer renders the explosive insensitive, or less sensitive, to the following actions: heat, shock, impact, percussion or friction. Typical phlegmatizing agents include, but are not limited to: wax, paper, water, polymers (such as chlorofluoropolymers), alcohol and oils (such as petroleum jelly and paraffin).

2.1.1.4 Hazard divisions

The six hazard divisions of class 1 are:

Division 1.1 Substances and articles which have a mass explosion hazard

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

This division comprises substances and articles:

.1 which give rise to considerable radiant heat; or

.2 which burn one after another, producing minor blast or projection effects or both.

Division 1.4 Substances and articles which present no significant hazard

This division comprises substances and articles which present only a small hazard in the event of ignition or initiation during transport. 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 must not cause virtually instantaneous explosion of almost the entire contents of the package.

Note: Substances and articles in this division are in compatibility group S if they are so packaged or designed that any hazardous effects arising from the 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 fire fighting or other emergency response efforts in the immediate vicinity of the package.

Division 1.5 Very insensitive substances which have a mass explosion hazard

This division comprises substances which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.

Note: The probability of transition from burning to detonation is greater when large quantities are transported in a ship. As a consequence, the stowage provisions for explosive substances in division 1.1 and for those in division 1.5 are identical.

Division 1.6 Extremely insensitive articles which do not have a mass explosion hazard

This division comprises articles which contain only extremely insensitive substances and which 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.

2.1.1.5 Any substance or article having or suspected of having explosive characteristics shall first be considered for classification in class 1 in accordance with the procedures in 2.1.3. Goods are not classified in class 1 when:

.1 unless specially authorized, the transport of an explosive substance is prohibited because sensitivity of the substance is excessive;

.2 the substance or article comes within the scope of those explosive substances and articles which are specifically excluded from class 1 by the definition of this class; or

.3 the substance or article has no explosive properties.

2.1.2 Compatibility groups and classification codes

2.1.2.1 Goods of class 1 are considered to be “compatible” if they can be safely stowed or transported together without significantly increasing either the probability of an accident or, for a given quantity, the magnitude of the effects of such an accident. By this criterion, goods listed in this class have been divided into a number of compatibility groups, each denoted by a letter from A to L (excluding I), N and S. These are described in 2.1.2.2 and 2.1.2.3.

2.1.2.2 Compatibility groups and classification codes

Description of substance or articles to be classified	Compatibility group	Classification code
Primary explosive substance	A	1.1A
Article containing a primary explosive substance and not containing 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	B	1.1B 1.2B 1.4B
Propellant explosive substance or other deflagrating explosive substance or article containing such explosive substance	C	1.1C 1.2C 1.3C 1.4C
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 containing two or more effective protective features	D	1.1D 1.2D 1.4D 1.5D
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)	E	1.1E 1.2E 1.4E
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	F	1.1F 1.2F 1.3F 1.4F
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 containing white phosphorus, phosphides, a pyrophoric substance, a flammable liquid or gel, or hypergolic liquids)	G	1.1G 1.2G 1.3G 1.4G
Article containing both an explosive substance and white phosphorus	H	1.2H 1.3H
Article containing both an explosive substance and a flammable liquid or gel	J	1.1J 1.2J 1.3J
Article containing both an explosive substance and a toxic chemical agent	K	1.2K 1.3K
Explosive substance or article containing an explosive substance and presenting a special risk (such as due to water-activation or presence of hypergolic liquids, phosphides or a pyrophoric substance) and needing isolation of each type (see 7.2.7.1.4, Note 2)	L	1.1L 1.2L 1.3L
Articles containing only extremely insensitive substances	N	1.6N
Substance or article so packaged 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 prohibit fire fighting or other emergency response efforts in the immediate vicinity of the package	S	1.4S

Note 1: 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 articles and packages shall be assigned to compatibility groups D or E.

Note 2: 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 when, in the opinion of the competent authority of the country of origin, the accidental functioning of the means of initiation does not cause the explosion of an article under normal conditions of transport. Such packages shall be assigned to compatibility groups D or E.

2.1.2.3 **Scheme of classification of explosives, combination of hazard division with compatibility group**

Hazard division	Compatibility group													∑ A–S
	A	B	C	D	E	F	G	H	J	K	L	N	S	
1.1	1.1A	1.1B	1.1C	1.1D	1.1E	1.1F	1.1G		1.1J		1.1L			9
1.2		1.2B	1.2C	1.2D	1.2E	1.2F	1.2G	1.2H	1.2J	1.2K	1.2L			10
1.3			1.3C			1.3F	1.3G	1.3H	1.3J	1.3K	1.3L			7
1.4		1.4B	1.4C	1.4D	1.4E	1.4F	1.4G						1.4S	7
1.5				1.5D										1
1.6												1.6N		1
∑ 1.1–1.6	**1**	**3**	**4**	**4**	**3**	**4**	**4**	**2**	**3**	**2**	**3**	**1**	**1**	**35**

2.1.2.4 The definitions of compatibility groups in 2.1.2.2 are intended to be mutually exclusive, except for a substance or article which qualifies for compatibility group S. Since the criterion of compatibility group S is an empirical one, assignment to this group is necessarily linked to the tests for assignment to division 1.4.

2.1.3 Classification procedure

2.1.3.1 Any substance or article having or suspected of having explosive characteristics shall be considered for classification in class 1. Substances and articles classified in class 1 shall be assigned to the appropriate division and compatibility group. Goods of class 1 shall be classified in accordance with the latest version of the United Nations *Manual of Tests and Criteria*.

2.1.3.2 Prior to transport, the classification of all explosive substances and articles, together with the compatibility group assignment and the Proper Shipping Name under which the substance or article is to be transported, shall have been approved by the competent authority of the country of manufacture. A new approval would be required for:

.1 a new explosive substance; or

.2 a new combination or mixture of explosive substances which is significantly different from other combinations or mixtures previously manufactured and approved; or

.3 a new design of an explosive article, an article containing a new explosive substance, or an article containing a new combination or mixture of explosive substances; or

.4 an explosive substance or article with a new design or type of packaging, including a new type of inner packaging.

2.1.3.3 Assessment of the hazard division is usually made on the basis of test results. A substance or article shall be assigned to the hazard division which corresponds to the results of the tests to which the substance or article, as offered for transport, has been subjected. Other test results, and data assembled from accidents which have occurred, may also be taken into account.

2.1.3.4 **Exclusion from Class 1**

2.1.3.4.1 The competent authority may exclude an article or substance from class 1 by virtue of test results and the Class 1 definition.

2.1.3.4.2 An article may be excluded from Class 1 by the competent authority when three unpackaged articles, each individually activated by its own means of initiation or ignition or external means to function in the designed mode, meet the following test criteria:

.1 No external surface shall have a temperature of more than 65°C. A momentary spike in temperature up to 200°C is acceptable;

.2 No rupture or fragmentation of the external casing or movement of the article or detached parts thereof of more than one metre in any direction;

Note: Where the integrity of the article may be affected in the event of an external fire these criteria shall be examined by a fire test, such as described in ISO 12097-3.

.3 No audible report exceeding 135 dB(C) peak at a distance of one metre;

.4 No flash or flame capable of igniting a material such as a sheet of 80 ± 10 g/m² paper in contact with the article; and

.5 No production of smoke, fumes or dust in such quantities that the visibility in a one cubic metre chamber equipped with appropriately sized blow out panels is reduced more than 50% as measured by a calibrated light (lux) meter or radiometer located one metre from a constant light source located at the midpoint on opposite walls. The general guidance on Optical Density Testing in ISO 5659-1 and the

general guidance on the Photometric System described in Section 7.5 in ISO 5659-2 may be used or similar optical density measurement methods designed to accomplish the same purpose may also be employed. A suitable hood cover surrounding the back and sides of the light meter shall be used to minimize effects of scattered or leaking light not emitted directly from the source.

Note 1: If during the tests addressing criteria .1, .2, .3 and .4 no or very little smoke is observed the test described in .5 may be waived.

Note 2: The competent authority may require testing in packaged form if it is determined that, as packaged for transport, the article may pose a greater risk.".

2.1.3.5 Assignment of fireworks to hazard divisions

2.1.3.5.1 Fireworks shall normally be assigned to hazard divisions 1.1, 1.2, 1.3, and 1.4 on the basis of test data derived from Test Series 6 of the United Nations *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 hazard divisions may also be made in accordance with the procedure in 2.1.3.5.2.

2.1.3.5.2 Assignment of fireworks to UN Nos. 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 2.1.3.5.5. 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 of the United Nations *Manual of Tests and Criteria*.

Note: The addition of other types of fireworks to column 1 of the table in 2.1.3.5.5 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.

2.1.3.5.3 Where fireworks of more than one hazard division are packed in the same package they shall be classified on the basis of the highest hazard division unless test data derived from Test Series 6 of the United Nations *Manual of Tests and Criteria* indicate otherwise.

2.1.3.5.4 The classification shown in the table in 2.1.3.5.5 applies only for articles packed in fibreboard boxes (4G).

2.1.3.5.5 Default fireworks classification table*

Note 1: References to percentages in the table, unless otherwise stated, are to the mass of all pyrotechnic substances (e.g., rocket motors, lifting charge, bursting charge and effect charge).

Note 2: "Flash composition" in this table refers to pyrotechnic substances 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 rise is demonstrated to be more than 8 ms for 0.5 g of pyrotechnic substance in the HSL Flash Composition Test in Appendix 7 of the United Nations *Manual of Tests and Criteria*.

Note 3: Dimensions in mm refers 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.

* This table contains a list of firework classifications that may be used in the absence of Test Series 6, of the United Nations *Manual of Tests and Criteria*, data (see 2.1.3.5.2).

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 substance and designed to be projected from a mortar	All report shells	1.1G
			Colour shell: $\geq$ 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
			Colour shell: $\leq$ 50 mm, or $\leq$ 60 g pyrotechnic substance, with $\leq$ 2% flash composition as loose powder and/or report effects	1.4G
	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	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	
			Colour shell: $\geq$ 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: $\leq$ 50 mm, or $<$ 60 g pyrotechnic substance, with $\leq$ 25% flash composition as loose powder and/or report effects	1.3G

Type	Includes: / Synonym:	Definition	Specification	Classification
	Shell of shells (spherical) (Reference to percentages for shell of shells are to the gross mass of the fireworks article)	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 ≤ 25 g flash composition per report unit, with ≤ 33% flash composition and ≥ 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 ≤ 70 mm and/or pyrotechnic units, with ≤ 25% flash composition and ≤ 60% pyrotechnic substance 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 ≤ 25% flash composition and ≤ 60% pyrotechnic substance 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	
Roman candle	Exhibition candle, candle, bombettes	Tube containing a series of pyrotechnic units consisting of alternate pyrotechnic substance, propellant charge, and transmitting fuse	≥ 50 mm inner diameter, containing flash composition, or < 50 mm with > 25% flash composition	1.1G
			≥ 50 mm inner diameter, containing no flash composition	1.2G
			< 50 mm inner diameter and ≤ 25% flash composition	1.3G
			≤ 30 mm inner diameter, each pyrotechnic unit ≤ 25 g and ≤ 5% flash composition	1.4G
Shot tube	Single shot Roman candle, small preloaded mortar	Tube containing a pyrotechnic unit consisting of pyrotechnic substance, propellant charge with or without transmitting fuse	≤ 30 mm inner diameter and pyrotechnic unit > 25 g, or > 5% and ≤ 25% flash composition	1.3G
			≤ 30 mm inner diameter, pyrotechnic unit ≤ 25 g and ≤ 5% flash composition	1.4G

Type	Includes: / Synonym:	Definition	Specification	Classification
Rocket	Avalanche rocket, signal rocket, whistling rocket, bottle rocket, sky rocket, missile type rocket, table rocket	Tube containing pyrotechnic substance and/or pyrotechnic units, equipped with stick(s) or other means for stabilization of flight, and designed to be propelled into the air	Flash composition effects only	1.1G
			Flash composition > 25% of the pyrotechnic substance	1.1G
			> 20 g pyrotechnic substance and flash composition ≤ 25 %	1.3G
			≤ 20 g pyrotechnic substance, black powder bursting charge and ≤ 0.13 g flash composition per report and ≤ 1 g in total	1.4G
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	1.1G
			≥ 180 mm and ≤ 25% flash composition, as loose powder and/or report effects	1.1G
			< 180 mm and ≤ 25% flash composition, as loose powder and/or report effects	1.3G
			≤ 150 g pyrotechnic substance, containing ≤ 5% flash composition as loose powder and/or report effects. Each pyrotechnic unit ≤ 25 g, each report effect < 2 g ; each whistle, if any, ≤ 3 g	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 substance producing sparks and flame	≥ 1 kg pyrotechnic substance	1.3G
			< 1 kg pyrotechnic substance	1.4G
Sparkler	Handheld sparklers, non-handheld sparklers, wire sparklers	Rigid wire partially coated (along one end) with slow-burning pyrotechnic substance with or without an ignition tip	Perchlorate based sparklers: > 5 g per item or > 10 items per pack	1.3G
			Perchlorate based sparklers: ≤ 5 g per item and ≤ 10 items per pack Nitrate based sparklers: ≤ 30 g per item	1.4G
Bengal stick	Dipped stick	Non-metallic stick partially coated (along one end) with slow-burning pyrotechnic substance and designed to be held in the hand	Perchlorate based items: > 5 g per item or > 10 items per pack	1.3G
			Perchlorate based items: ≤ 5 g per item and ≤ 10 items per pack; nitrate based items: ≤ 30 g per item	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 substance	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 phosphorus mixture; other articles may contain up to 5 g of pyrotechnic substance, but no flash composition	1.4G
Spinner	Aerial spinner, helicopter, chaser, ground spinner	Non-metallic tube or tubes containing gas- or spark-producing pyrotechnic substance, with or without noise-producing substance, with or without aerofoils attached	Pyrotechnic substance per item > 20 g, containing ≤ 3% flash composition as report effects, or whistle composition ≤ 5 g	1.3G
			Pyrotechnic substance per item ≤ 20 g, containing ≤ 3% flash composition as report effects, or whistle composition ≤ 5 g	1.4G
Wheels	Catherine wheels, Saxon	Assembly including drivers containing pyrotechnic substance and provided with a means of attaching it to a support so that it can rotate	≥ 1 kg total pyrotechnic substance, no report effect, each whistle (if any) ≤ 25 g and ≤ 50 g whistle composition per wheel	1.3G
			< 1 kg total pyrotechnic substance, no report effect, each whistle (if any) ≤ 5 g and ≤ 10 g whistle composition per wheel	1.4G
Aerial wheel	Flying Saxon, UFOs, rising crown	Tubes containing propellant charges and sparks-, flame- and/or noise-producing pyrotechnic substances, the tubes being fixed to a supporting ring	> 200 g total pyrotechnic substance or > 60 g pyrotechnic substance per driver, ≤ 3% flash composition as report effects, each whistle (if any) ≤ 25 g and ≤ 50 g whistle composition per wheel	1.3G
			≤ 200 g total pyrotechnic substance and ≤ 60 g pyrotechnic substance per driver, ≤ 3% flash composition as report effects, each whistle (if any) ≤ 5 g and ≤ 10 g whistle composition per wheel	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	The most hazardous firework type determines the classification	
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

Chapter 2.2

Class 2 – Gases

2.2.0 Introductory note

"Toxic" has the same meaning as "poisonous".

2.2.1 Definitions and general provisions

2.2.1.1 A gas is a substance which:

.1 at 50°C has a vapour pressure greater than 300 kPa; or

.2 is completely gaseous at 20°C at a standard pressure of 101.3 kPa.

2.2.1.2 The transport condition of a gas is described according to its physical state as:

.1 *Compressed gas:* a gas which when packaged under pressure for transport 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 transport is partially liquid at temperatures above −50 °C. A distinction is made between:

high pressure liquefied gas: a gas with a critical temperature between −50°C and +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 transport is made partially liquid because of its low temperature; or

.4 *Dissolved gas:* a gas which when packaged under pressure for transport is dissolved in a liquid phase solvent.

2.2.1.3 The class comprises compressed gases, liquefied gases, dissolved gases, refrigerated liquefied gases, mixtures of one or more gases with one or more vapours of substances of other classes, articles charged with a gas and aerosols.

2.2.1.4 Gases are normally transported under pressure varying from high pressure in the case of compressed gases to low pressure in the case of refrigerated gases.

2.2.1.5 According to their chemical properties or physiological effects, which may vary widely, gases may be: flammable; non-flammable; non-toxic; toxic; supporters of combustion; corrosive; or may possess two or more of these properties simultaneously.

2.2.1.5.1 Some gases are chemically and physiologically inert. Such gases as well as other gases, normally accepted as non-toxic, will nevertheless be suffocating in high concentrations.

2.2.1.5.2 Many gases of this class have narcotic effects which may occur at comparatively low concentrations or may evolve highly toxic gases when involved in a fire.

2.2.1.5.3 All gases which are heavier than air will present a potential danger if allowed to accumulate in the bottom of cargo spaces.

2.2.2 Class subdivisions

Class 2 is subdivided further according to the primary hazard of the gas during transport:

Note: For UN 1950 AEROSOLS, see also the criteria in special provision 63 and for UN 2037 RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES) see also special provision 303.

2.2.2.1 Class 2.1 Flammable gases

Gases which at 20°C and a standard pressure of 101.3 kPa:

.1 are ignitable when in a mixture of 13% or less by volume with air; or

.2 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 calculation in accordance with methods adopted by the International Organization for Standardization (see ISO 10156:2010). Where insufficient data are available to use these methods, tests by a comparable method recognized by a national competent authority may be used.

2.2.2.2 **Class 2.2 Non-flammable, non-toxic gases**

Gases which:

.1 are asphyxiant – gases which dilute or replace the oxygen normally in the atmosphere; or

.2 are oxidizing – gases which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does; or

.3 do not come under the other classes.

Note: In 2.2.2.2.2, "gases which cause or contribute to the combustion of other material more than air does" means pure gases or gas mixtures with an oxidizing power greater than 23.5% as determined by a method specified in ISO 10156:2010.

2.2.2.3 **Class 2.3 Toxic gases**

Gases which:

.1 are known to be so toxic or corrosive to humans as to pose a hazard to health; or

.2 are presumed to be toxic or corrosive to humans because they have a LC_{50} value (as defined in 2.6.2.1) equal to or less than 5,000 $m\ell/m^3$ (ppm).

Note: Gases meeting the above criteria owing to their corrosivity are to be classified as toxic with a subsidiary corrosive risk.

2.2.2.4 Gases and gas mixtures with hazards associated with more than one division take the following precedence:

.1 class 2.3 takes precedence over all other classes;

.2 class 2.1 takes precedence over class 2.2.

2.2.2.5 Gases of class 2.2 are not subject to the provisions of this Code if they are transported at a pressure of less than 200 kPa at 20°C and are not liquefied or refrigerated liquefied gases.

2.2.2.6 Gases of class 2.2 are not subject to the provisions of this Code when contained in the following:

.1 Foodstuffs (except UN 1950), including carbonated beverages;

.2 Balls intended for use in sports;

.3 Tyres (except for air transport); or

.4 Light bulbs provided they are packaged so that the projectile effects of any rupture of the bulb will be contained within the package.

2.2.3 Mixtures of gases

For the classification of gas mixtures (including vapours of substances from other classes), the following principles shall be used:

.1 Flammability shall be determined by tests or calculation in accordance with methods adopted by the International Organization for Standardization (see ISO Standard 10156:2010). Where insufficient data are available to use these methods, tests by a comparable method recognized by a national competent authority may be used.

.2 The level of toxicity is determined either by tests to measure the LC_{50} value (as defined in 2.6.2.1) or by a calculation method using the following formula:

$$LC_{50} \quad \text{Toxic (mixture)} = \frac{1}{\sum_{i=1}^{n} \frac{f_i}{T_i}}$$

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 LC_{50} value when available).

When LC_{50} values are unknown, the toxicity index is determined by using the lowest LC_{50} value of substances of similar physiological and chemical effects, or through testing if this is the only practical possibility.

.3 A gas mixture 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 LC_{50} value of the corrosive components of the mixture is equal to or less than 5,000 $m\ell/m^3$ (ppm) when the LC_{50} is calculated by the formula:

$$LC_{50} \quad \text{Corrosive (mixture)} = \frac{1}{\sum_{i=1}^{n} \frac{f_{ci}}{T_{ci}}}$$

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 LC_{50} value when available).

.4 Oxidizing ability is determined either by tests or by calculation methods adopted by the International Organization for Standardization (see note in 2.2.2.2).

Chapter 2.3

Class 3 – Flammable liquids

2.3.0 Introductory note

The flashpoint of a flammable liquid may be altered by the presence of an impurity. The substances listed in class 3 in the Dangerous Goods List in chapter 3.2 shall generally be regarded as chemically pure. Since commercial products may contain added substances or impurities, flashpoints may vary, and this may have an effect on classification or determination of the packing group for the product. In the event of doubt regarding the classification or packing group of a substance, the flashpoint of the substance shall be determined experimentally.

2.3.1 Definitions and general provisions

2.3.1.1 Class 3 includes the following substances:

.1 flammable liquids (see 2.3.1.2 and 2.3.1.3);

.2 liquid desensitized explosives (see 2.3.1.4).

2.3.1.2 *Flammable liquids* are liquids, or mixtures of liquids, or liquids containing solids in solution or suspension (such as paints, varnishes, lacquers, etc., but not including substances which, on account of their other dangerous characteristics, have been included in other classes) which give off a flammable vapour at or below 60°C closed-cup test (corresponding to 65.6°C open-cup test), normally referred to as the "flashpoint". This also includes:

.1 liquids offered for transport at temperatures at or above their flashpoint; and

.2 substances transported or offered for transport at elevated temperatures in a liquid state, which give off a flammable vapour at temperatures equal to or below the maximum transport temperature.

2.3.1.3 However, the provisions of this Code need not apply to such liquids with a flashpoint of more than 35°C which do not sustain combustion. Liquids are considered to be unable to sustain combustion for the purposes of the Code if:

.1 they have passed the suitable combustibility test (see the Sustained Combustibility Test prescribed in part III, 32.5.2 of the United Nations *Manual of Tests and Criteria*); or

.2 their fire point according to ISO 2592:1973 is greater than 100°C; or

.3 they are water-miscible solutions with a water content of more than 90%, by mass.

2.3.1.4 *Liquid desensitized explosives* are explosive substances which are dissolved or suspended in water or other liquid substances, to form a homogeneous liquid mixture to suppress their explosive properties. Entries in the Dangerous Goods List for liquid desensitized explosives are UN 1204, UN 2059, UN 3064, UN 3343, UN 3357 and UN 3379.

2.3.2 Assignment of packing group

2.3.2.1 The criteria in 2.3.2.6 are used to determine the hazard grouping of a liquid that presents a risk due to flammability.

2.3.2.1.1 For liquids whose only risk is flammability, the packing group for the substance is the hazard grouping shown in 2.3.2.6.

2.3.2.1.2 For a liquid with additional risk(s), the hazard group determined from 2.3.2.6 and the hazard group based on the severity of the additional risk(s) shall be considered, and the classification and packing group determined in accordance with the provisions in chapter 2.0.

2.3.2.2 Viscous substances such as paints, enamels, lacquers, varnishes, adhesives and polishes having a flashpoint of less than 23°C may be placed in packing group III in conformity with the procedures prescribed in part III, chapter 32.3, of the United Nations *Manual of Tests and Criteria* on the basis of:

.1 the viscosity, expressed as the flowtime in seconds;

.2 the closed-cup flashpoint;

.3 a solvent separation test.

2.3.2.3 Viscous flammable liquids such as paints, enamels, varnishes, adhesives and polishes with a flashpoint of less than 23°C are included in packing group III provided that:

.1 less than 3% of the clear solvent layer separates in the solvent separation test;

.2 the mixture or any separated solvent does not meet the criteria for class 6.1 or class 8.

.3 the viscosity and flashpoint are in accordance with the following table:

Flow time *t* in seconds	Jet diameter in mm	Flashpoint in °C c.c.
$20 < t \leq 60$	4	above 17
$60 < t \leq 100$	4	above 10
$20 < t \leq 32$	6	above 5
$32 < t \leq 44$	6	above –1
$44 < t \leq 100$	6	above –5
$100 < t$	6	–5 and below

.4 the capacity of the receptacle used does not exceed 30 ℓ.

2.3.2.4 Substances classified as flammable liquids due to their being transported or offered for transport at elevated temperatures are included in packing group III.

2.3.2.5 Viscous substances which:

- have a flashpoint of 23°C or above and less than or equal to 60°C;
- are not toxic, corrosive or environmentally hazardous;
- contain not more than 20% nitrocellulose, provided the nitrocellulose contains not more than 12.6% nitrogen by dry mass; and
- are packed in receptacles not exceeding 30 ℓ capacity

are not subject to the provisions for the marking, labelling and testing of packages in chapters 4.1, 5.2 and 6.1, if:

.1 in the solvent separation test (see part III, 32.5.1 of the United Nations *Manual of Tests and Criteria*) the height of the separated layer of solvent is less than 3% of the total height; and

.2 the flowtime in the viscosity test (see part III, 32.4.3 of the United Nations *Manual of Tests and Criteria*) with a jet diameter of 6 mm is equal to or greater than:

.1 60 s; or

.2 40 s if the viscous substance contains not more than 60% of class 3 substances.

The following statement shall be included in the transport document: "Transport in accordance with 2.3.2.5 of the IMDG Code." (see 5.4.1.5.10).

2.3.2.6 Hazard grouping based on flammability

Flammable liquids are grouped for packing purposes according to their flashpoint, their boiling point, and their viscosity. This table shows the relationship between two of these characteristics.

Packing group	Flashpoint in °C closed cup (c.c.)	Initial boiling point in °C
I	–	≤ 35
II	< 23	> 35
III	≥ 23 to ≤ 60	> 35

2.3.3 Determination of flashpoint

Note: The provisions of this section are not mandatory.

2.3.3.1 The flashpoint of a flammable liquid is the lowest temperature of the liquid at which its vapour forms an ignitable mixture with air. It gives a measure of the risk of formation of explosive or ignitable mixtures when the liquid escapes from its packing. A flammable liquid cannot be ignited so long as its temperature remains below the flashpoint.

Note: Do not confuse the flashpoint with the ignition temperature, which is the temperature to which an explosive vapour–air mixture must be heated to cause actual explosion. There is no relationship between the flashpoint and the ignition temperature.

2.3.3.2 The flashpoint is not an exact physical constant for a given liquid. It depends to some extent on the construction of the test apparatus used and on the testing procedure. Therefore, when providing flashpoint data, specify the name of the test apparatus.

2.3.3.3 Several standard apparatuses are in current use. They all operate on the same principle: a specified quantity of the liquid is introduced into a receptacle at a temperature well below the flashpoint to be expected, then slowly heated; periodically, a small flame is brought near to the surface of the liquid. The flashpoint is the lowest temperature at which a "flash" is observed.

2.3.3.4 The test methods can be divided into two groups, depending on the use in an apparatus of an open receptacle (open-cup methods) or a closed one which is only opened to admit the flame (closed-cup methods). As a rule, the flashpoints found in an open-cup test are a few degrees higher than in a closed-cup test.

2.3.3.5 In general, reproducibility in closed-cup apparatus is better than in open-cup.

2.3.3.5.1 It is therefore recommended that flashpoints, especially in the range around 23°C, shall be determined by means of closed-cup (c.c) methods.

2.3.3.5.2 Flashpoint data in this Code are generally based on closed-cup methods. In countries where it is customary to determine flashpoints by the open-cup method, the temperatures given by that method would need to be reduced to correspond with those in this Code.

2.3.3.6 Determination of flashpoint

The following methods for determining the flashpoint of flammable liquids may be used:

International standards:

ISO 1516
ISO 1523
ISO 2719
ISO 13736
ISO 3679
ISO 3680

National standards:

American Society for Testing Materials International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, USA 19428-2959:

ASTM D3828-07a, Standard Test Methods for Flash Point by Small Scale Closed Cup Tester
ASTM D56-05, Standard Test Method for Flash Point by Tag Closed Cup Tester
ASTM D3278-96(2004)e, Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus
ASTM D93-08, Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester.

Association française de normalisation, AFNOR, 11, rue de Pressensé, 93571 La Plaine Saint-Denis Cedex:

French Standard NF M 07-019
French Standards NF M 07-011/NF T 30-050/NF T 66-009
French Standard NF M 07-036

Deutsches Institut für Normung, Burggrafenstr. 6, D-10787 Berlin:

Standard DIN 51755 (flashpoints below 65°C)

State Committee of the Council of Ministers for Standardization, 113813, GSP, Moscow, M-49 Leninsky Prospect, 9:

GOST 12.1.044-84

2.3.4 Determination of initial boiling point

The following methods for determining the initial boiling point of flammable liquids may be used:

International standards:

ISO 3924
ISO 4626
ISO 3405

National standards:

American Society for Testing Materials International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, USA 19428-2959:

ASTM D86-07a, Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure
ASTM D1078-05, Standard Test Method for Distillation Range of Volatile Organic Liquids

Further acceptable methods:

Method A.2 as described in Part A of the Annex to Commission Regulation (EC) No 440/2008.*

* Commission Regulation (EC) No 440/2008 of 30 May 2008 laying down test methods pursuant to Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (Official Journal of the European Union, No L 142 of 31.05.2008, pages 1–739 and No L 143 of 03.06.2008, page 55).

Chapter 2.4

Class 4 – Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases

2.4.0 Introductory 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 flowchart for these substances is given in 2.4.5.

2.4.1 Definition and general provisions

2.4.1.1 In this Code, class 4 deals with substances, other than those classified as explosives, which, under conditions of transport, are readily combustible or may cause or contribute to a fire. Class 4 is subdivided as follows:

Class 4.1 – Flammable solids
Solids which, under conditions encountered in transport, are readily combustible or may cause or contribute to fire through friction; self-reactive substances (solids and liquids) which are liable to undergo a strongly exothermic reaction; solid desensitized explosives which may explode if not diluted sufficiently;

Class 4.2 – Substances liable to spontaneous combustion
Substances (solids and liquids) which are liable to spontaneous heating under normal conditions encountered in transport, or to heating up in contact with air, and being then liable to catch fire;

Class 4.3 – Substances which, in contact with water, emit flammable gases
Substances (solids and liquids) which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.

2.4.1.2 As referenced in this chapter, test methods and criteria, with advice on application of the tests, are given in the United Nations *Manual of Tests and Criteria* for the classification of following types of substances of class 4:

.1 flammable solids (class 4.1);

.2 self-reactive substances (class 4.1);

.3 pyrophoric solids (class 4.2);

.4 pyrophoric liquids (class 4.2);

.5 self-heating substances (class 4.2); and

.6 substances which, in contact with water, emit flammable gases (class 4.3).

Test methods and criteria for self-reactive substances are given in part II of the United Nations *Manual of Tests and Criteria*, and test methods and criteria for the other types of substances of class 4 are given in the United Nations *Manual of Tests and Criteria*, part III, chapter 33.

2.4.2 Class 4.1 – Flammable solids, self-reactive substances and solid desensitized explosives

2.4.2.1 General

Class 4.1 includes the following types of substances:

.1 flammable solids (see 2.4.2.2);

.2 self-reactive substances (see 2.4.2.3); and

.3 solid desensitized explosives (see 2.4.2.4).

Some substances (such as celluloid) may evolve toxic and flammable gases when heated or if involved in a fire.

2.4.2.2 Class 4.1 Flammable solids

2.4.2.2.1 *Definitions and properties*

2.4.2.2.1.1 For the purpose of this Code, *flammable solids* means readily combustible solids and solids which may cause fire through friction.

2.4.2.2.1.2 *Readily combustible solids* means fibres, 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.

2.4.2.2.2 *Classification of flammable solids*

2.4.2.2.2.1 Powdered, granular or pasty substances shall be classified as readily combustible solids of class 4.1 when the time of burning of one or more of the test runs, performed in accordance with the test method described in the United Nations *Manual of Tests and Criteria*, part III, 33.2.1, is less than 45 s or the rate of burning is more than 2.2 mm/s. Powders of metals or metal alloys shall be classified in class 4.1 when they can be ignited and the reaction spreads over the whole length of the sample in 10 minutes or less.

2.4.2.2.2.2 Solids which may cause fire through friction shall be classified in class 4.1 by analogy with existing entries (such as matches) until definitive criteria are established.

2.4.2.2.3 *Assignment of packing groups*

2.4.2.2.3.1 Packing groups are assigned on the basis of the test methods referred to in 2.4.2.2.2.1. For readily combustible solids (other than metal powders), packing group II shall be assigned if the burning time is less than 45 s and the flame passes the wetted zone. Packing group II shall be assigned to powders of metal or metal alloys if the zone of reaction spreads over the whole length of the sample in five minutes or less.

2.4.2.2.3.2 Packing groups are assigned on the basis of the test methods referred to in 2.4.2.2.2.1. For readily combustible solids (other than metal powders), packing group III shall be assigned if the burning time is less than 45 s and the wetted zone stops the flame propagation for at least four minutes. Packing group III shall be assigned to metal powders if the reaction spreads over the whole length of the sample in more than five minutes but not more than ten minutes.

2.4.2.2.3.3 For solids which may cause fire through friction, the packing group shall be assigned by analogy with existing entries or in accordance with any appropriate special provision.

2.4.2.2.4 Pyrophoric metal powders, if wetted with sufficient water to suppress their pyrophoric properties, may be classified as class 4.1.

2.4.2.3 Class 4.1 Self-reactive substances

2.4.2.3.1 *Definitions and properties*

2.4.2.3.1.1 For the purposes of this Code:

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:

.1 they are explosives according to the criteria of class 1;

.2 they are oxidizing substances according to the classification procedure for class 5.1 (see 2.5.2) 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 3;

.3 they are organic peroxides according to the criteria of class 5.2;

.4 their heat of decomposition is less than 300 J/g; or

.5 their self-accelerating decomposition temperature (SADT) (see 2.4.2.3.4) is greater than 75°C for a 50 kg package.

Note 1: The heat of decomposition may be determined using any internationally recognized method such as differential scanning calorimetry and adiabatic calorimetry.

Note 2: 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 2.4.3.2 for inclusion in class 4.2.

Note 3: 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 .1, .3, .4 or .5 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 of 2.4.2.3.3.2.7 shall be considered for classification as a substance of class 5.1 (see 2.5.2).

2.4.2.3.1.2 The decomposition of self-reactive substances can be initiated by heat, contact with catalytic impurities (such as 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. Some self-reactive substances burn vigorously. Self-reactive substances are, for example, some compounds of the types listed below:

.1 aliphatic azo compounds (–C–N=N–C–);

.2 organic azides (–C–N_3);

.3 diazonium salts (–CN_2^+ Z^-);

.4 *N*-nitroso compounds (–N–N=O); and

.5 aromatic sulphohydrazides (–SO_2–NH–NH_2).

This list is not exhaustive and substances with other reactive groups and some mixtures of substances may have similar properties.

2.4.2.3.2 *Classification of self-reactive substances*

2.4.2.3.2.1 Self-reactive substances are classified into seven types according to the degree of danger they present. The types of self-reactive substance range from type A, which may not be accepted for transport 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.

2.4.2.3.2.2 Self-reactive substances permitted for transport in packagings are listed in 2.4.2.3.2.3, those permitted for transport in IBCs are listed in packing instruction IBC520 and those permitted for transport in portable tanks are listed in portable tank instruction T23. For each permitted substance listed, the appropriate generic entry of the Dangerous Goods List (UN 3221 to UN 3240) is assigned, and appropriate subsidiary risks and remarks providing relevant transport information are given. The generic entries specify:

.1 self-reactive substance type (B to F);

.2 physical state (liquid or solid); and

.3 temperature control, when required (2.4.2.3.4).

2.4.2.3.2.3 *List of currently assigned self-reactive substances in packagings*

In the column "Packing Method" codes "OP1" to "OP8" refer to packing methods in packing instruction P520. Self-reactive substances to be transported shall fulfill the classification and the control and emergency temperatures (derived from the SADT) as listed. For substances permitted in IBCs, see packing instruction IBC520, and for those permitted in tanks, see 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 substances may be classified differently following the procedures in 2.4.2.3.3 and 2.4.2.3.4.

UN generic entry	SELF-REACTIVE SUBSTANCE	Concentration (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Remarks
3222	2-DIAZO-1-NAPHTHOL-4-SULPHONYL CHLORIDE	100	OP5			(2)
	2-DIAZO-1-NAPHTHOL-5-SULPHONYL CHLORIDE	100	OP5			(2)
3223	SELF-REACTIVE LIQUID, SAMPLE		OP2			(8)

UN generic entry	SELF-REACTIVE SUBSTANCE	Concentration (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Remarks
3224	AZODICARBONAMIDE FORMULATION TYPE C	< 100	OP6			(3)
	2,2′-AZODI(ISOBUTYRONITRILE) as a water-based paste	≤ 50	OP6			
	N,N′-DINITROSO-*N,N′*-DIMETHYL-TEREPHTHALAMIDE, as a paste	72	OP6			
	N,N′-DINITROSOPENTAMETHYLENETETRAMINE	82	OP6			(7)
	SELF-REACTIVE SOLID, SAMPLE		OP2			(8)
3226	AZODICARBONAMIDE FORMULATION TYPE D	< 100	OP7			(5)
	1,1′-AZODI(HEXAHYDROBENZONITRILE)	100	OP7			
	BENZENE-1,3-DISULPHONYL HYDRAZIDE as a paste	52	OP7			
	BENZENESULPHONYL HYDRAZIDE	100	OP7			
	4-(BENZYL(ETHYL)AMINO)-3-ETHOXY-BENZENEDIAZONIUM ZINC CHLORIDE	100	OP7			
	3-CHLORO-4-DIETHYLAMINOBENZENE-DIAZONIUM ZINC CHLORIDE	100	OP7			
	2-DIAZO-1-NAPHTHOLSULPHONIC ACID ESTER MIXTURE TYPE D	< 100	OP7			(9)
	2,5-DIETHOXY-4-(4-MORPHOLINYL)-BENZENEDIAZONIUM SULPHATE	100	OP7			
	DIPHENYLOXIDE-4,4′-DISULPHONYL HYDRAZIDE	100	OP7			
	4-DIPROPYLAMINOBENZENEDIAZONIUM ZINC CHLORIDE	100	OP7			
	4-METHYLBENZENESULPHONYLHYDRAZIDE	100	OP7			
	SODIUM 2-DIAZO-1-NAPHTHOL-4-SULPHONATE	100	OP7			
	SODIUM 2-DIAZO-1-NAPHTHOL-5-SULPHONATE	100	OP7			
3228	ACETONE–PYROGALLOL COPOLYMER 2-DIAZO-1-NAPHTHOL-5-SULPHONATE	100	OP8			
	4-(DIMETHYLAMINO)BENZENEDIAZONIUM TRICHLOROZINCATE(–1)	100	OP8			
	2,5-DIBUTOXY-4-(4-MORPHOLINYL)-BENZENEDIAZONIUM TETRACHLOROZINCATE(2:1)	100	OP8			
3232	AZODICARBONAMIDE FORMULATION TYPE B, TEMPERATURE CONTROLLED	< 100	OP5			(1) (2)
3233	SELF-REACTIVE LIQUID, SAMPLE, TEMPERATURE CONTROLLED		OP2			(8)
3234	AZODICARBONAMIDE FORMULATION TYPE C, TEMPERATURE CONTROLLED	< 100	OP6			(4)
	2,2′-AZODI(ISOBUTYRONITRILE)	100	OP6	+40	+45	
	3-METHYL-4-(PYRROLIDIN-1-YL)BENZENE-DIAZONIUM TETRAFLUOROBORATE	95	OP6	+45	+50	
	SELF-REACTIVE SOLID, SAMPLE, TEMPERATURE CONTROLLED		OP2			(8)
	TETRAMINEPALLADIUM(II) NITRATE	100	OP6	+30	+35	
3235	2,2′-AZODI(ETHYL-2-METHYLPROPIONATE)	100	OP7	+20	+25	

UN generic entry	SELF-REACTIVE SUBSTANCE	Concentration (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Remarks
3236	AZODICARBONAMIDE FORMULATION TYPE D, TEMPERATURE CONTROLLED	< 100	OP7			(6)
	2,2′-AZODI(2,4-DIMETHYL-4-METHOXY-VALERONITRILE)	100	OP7	−5	+5	
	2,2′-AZODI(2,4-DIMETHYLVALERONITRILE)	100	OP7	+10	+15	
	2,2′-AZODI(2-METHYLBUTYRONITRILE)	100	OP7	+35	+40	
	4-(BENZYL(METHYL)AMINO)-3-ETHOXY-BENZENEDIAZONIUM ZINC CHLORIDE	100	OP7	+40	+45	
	2,5-DIETHOXY-4-MORPHOLINO-BENZENEDIAZONIUM ZINC CHLORIDE	67–100	OP7	+35	+40	
	2,5-DIETHOXY-4-MORPHOLINO-BENZENEDIAZONIUM ZINC CHLORIDE	66	OP7	+40	+45	
	2,5-DIETHOXY-4-MORPHOLINOBENZENE-DIAZONIUM TETRAFLUOROBORATE	100	OP7	+30	+35	
	2,5-DIETHOXY-4-(PHENYLSULPHONYL)-BENZENEDIAZONIUM ZINC CHLORIDE	67	OP7	+40	+45	
	2,5-DIMETHOXY-4-(4-METHYLPHENYL-SULPHONYL)BENZENEDIAZONIUM ZINC CHLORIDE	79	OP7	+40	+45	
	4-DIMETHYLAMINO-6-(2-DIMETHYLAMINO-ETHOXY)TOLUENE-2-DIAZONIUM ZINC CHLORIDE	100	OP7	+40	+45	
	2-(N,N-ETHOXYCARBONYLPHENYLAMINO)-3-METHOXY-4-(N-METHYL-N-CYCLOHEXYLAMINO)-BENZENEDIAZONIUM ZINC CHLORIDE	63–92	OP7	+40	+45	
	2-(N,N-ETHOXYCARBONYLPHENYLAMINO)-3-METHOXY-4-(N-METHYL-N-CYCLOHEXYLAMINO)-BENZENEDIAZONIUM ZINC CHLORIDE	62	OP7	+35	+40	
	N-FORMYL-2-(NITROMETHYLENE)-1,3-PERHYDROTHIAZINE	100	OP7	+45	+50	
	2-(2-HYDROXYETHOXY)-1-(PYRROLIDIN-1-YL)-BENZENE-4-DIAZONIUM ZINC CHLORIDE	100	OP7	+45	+50	
	3-(2-HYDROXYETHOXY)-4-(PYRROLIDIN-1-YL)-BENZENEDIAZONIUM ZINC CHLORIDE	100	OP7	+40	+45	
	2-(N,N-METHYLAMINOETHYLCARBONYL)-4-(3,4-DIMETHYLPHENYLSULPHONYL)-BENZENEDIAZONIUM HYDROGEN SULPHATE	96	OP7	+45	+50	
	4-NITROSOPHENOL	100	OP7	+35	+40	
3237	DIETHYLENEGLYCOL BIS(ALLYLCARBONATE) + DI-ISOPROPYL PEROXYDICARBONATE	≥ 88 + ≤ 12	OP8	−10	0	

Remarks

(1) Azodicarbonamide formulations which fulfil the criteria of 2.4.2.3.3.2.2. The control and emergency temperatures shall be determined by the procedure given in 7.3.7.2.

(2) "EXPLOSIVE" subsidiary risk label (Model No 1, see 5.2.2.2.2) required.

(3) Azodicarbonamide formulations which fulfil the criteria of 2.4.2.3.3.2.3.

(4) Azodicarbonamide formulations which fulfil the criteria of 2.4.2.3.3.2.3. The control and emergency temperatures shall be determined by the procedure given in 7.3.7.2.

(5) Azodicarbonamide formulations which fulfil the criteria of 2.4.2.3.3.2.4.

(6) Azodicarbonamide formulations which fulfil the criteria of 2.4.2.3.3.2.4. The control and emergency temperatures shall be determined by the procedure given in 7.3.7.2.

(7) With a compatible diluent having a boiling point of not less than 150°C.

(8) See 2.4.2.3.2.4.2.

(9) This entry applies to mixtures of esters of 2-diazo-1-naphthol-4-sulphonic acid and 2-diazo-1-naphthol-5-sulphonic acid meeting the criteria of 2.4.2.3.3.2.4.

2.4.2.3.2.4 Classification of self-reactive substances not listed in 2.4.2.3.2.3, packing instruction IBC520 or portable tank instruction T23 and assignment to a generic entry shall be made by the competent authority of the country of origin on the basis of a test report. Principles applying to the classification of such substances are provided in 2.4.2.3.3. The applicable classification procedures, test methods and criteria, and an example of a suitable test report, are given in the United Nations *Manual of Tests and Criteria*, part II. The statement of approval shall contain the classification and the relevant transport conditions.

.1 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 this classification procedure.

.2 Samples of self-reactive substances or formulations of self-reactive substances not listed in 2.4.2.3.2.3, for which a complete set of test results is not available and which are to be transported for further testing or evaluation, may be assigned to one of the appropriate entries for self-reactive substances type C provided the following conditions are met:

.1 the available data indicate that the sample would be no more dangerous than self-reactive substances type B;

.2 the sample is packaged in accordance with packing method OP2 (see applicable packing instruction) and the quantity per cargo transport unit is limited to 10 kg; and

.3 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.

2.4.2.3.3 *Principles for classification of self-reactive substances*

Note: This section refers only to those properties of self-reactive substances which are decisive for their classification. A flow chart, presenting the classification principles in the form of a graphically arranged scheme of questions concerning the decisive properties together with the possible answers, is given in Figure 2.4.1 in chapter 2.4 of the United Nations *Recommendations on the Transport of Dangerous Goods*. These properties shall be determined experimentally. Suitable test methods with pertinent evaluation criteria are given in the United Nations *Manual of Tests and Criteria*, part II.

2.4.2.3.3.1 A self-reactive substance is regarded as possessing explosive properties when, in laboratory testing, the formulation is liable to detonate, to deflagrate rapidly or to show a violent effect when heated under confinement.

2.4.2.3.3.2 The following principles apply to the classification of self-reactive substances not listed in 2.4.2.3.2.3:

.1 Any substance which can detonate or deflagrate rapidly, as packaged for transport, is prohibited from transport under the provisions for self-reactive substances of class 4.1 in that packaging (defined as SELF-REACTIVE SUBSTANCE TYPE A);

.2 Any substance possessing explosive properties and which, as packaged for transport, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package, shall also bear an "EXPLOSIVE" subsidiary risk label (Model No. 1, see 5.2.2.2.2). Such a substance may be packaged in amounts of up to 25 kg unless the maximum quantity has to be limited to a lower amount to preclude detonation or rapid deflagration in the package (defined as SELF-REACTIVE SUBSTANCE TYPE B);

.3 Any substance possessing explosive properties may be transported without an "EXPLOSIVE" subsidiary risk label when the substance as packaged (maximum 50 kg) for transport cannot detonate or deflagrate rapidly or undergo a thermal explosion (defined as SELF-REACTIVE SUBSTANCE TYPE C);

.4 Any substance which, in laboratory testing:

.1 detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or

.2 does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or

.3 does not detonate or deflagrate at all and shows a medium effect when heated under confinement

may be accepted for transport in packages of not more than 50 kg net mass (defined as SELF-REACTIVE SUBSTANCE TYPE D);

.5 Any substance which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement may be accepted for transport in packages of not more than 400 kg/450 ℓ (defined as SELF-REACTIVE SUBSTANCE TYPE E);

.6 Any substance which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power may be considered for transport in IBCs (defined as SELF-REACTIVE SUBSTANCE TYPE F); (for additional provisions see 4.1.7.2.2);

.7 Any substance which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement nor any explosive power shall be exempted from classification as a self-reactive substance of class 4.1 provided that the formulation is thermally stable (self-accelerating decomposition temperature 60°C to 75°C for a 50 kg package) and any diluent meets the provisions of 2.4.2.3.5 (defined as SELF-REACTIVE SUBSTANCE TYPE G). If the formulation is not thermally stable or a compatible diluent having a boiling point less than 150°C is used for desensitization, the formulation shall be defined as SELF-REACTIVE LIQUID/SOLID TYPE F.

2.4.2.3.4 *Temperature control provisions*

2.4.2.3.4.1 Self-reactive substances are subject to temperature control in transport if their self-accelerating decomposition temperature (SADT) is less than or equal to 55°C. For currently assigned self-reactive substances, the control and emergency temperatures are shown in 2.4.2.3.2.3. Test methods for determining the SADT are given in the United Nations *Manual of Tests and Criteria*, part II, chapter 28. The test selected shall be conducted in a manner which is representative, both in size and material, of the package to be transported. The temperature control provisions are given in 7.3.7.

2.4.2.3.5 *Desensitization of self-reactive substances*

2.4.2.3.5.1 In order to ensure safety during transport, self-reactive substances may be desensitized through the use of a diluent. If a diluent is used, the self-reactive substance shall be tested with the diluent present in the concentration and form used in transport.

2.4.2.3.5.2 Diluents which may allow a self-reactive substance to concentrate to a dangerous extent in the event of leakage from a package shall not be used.

2.4.2.3.5.3 The 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.

2.4.2.3.5.4 Liquid diluents in liquid formulations requiring temperature control shall have a boiling point of at least 60°C and a flashpoint 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 (see 7.3.7.2).

2.4.2.4 Class 4.1 Solid desensitized explosives

2.4.2.4.1 *Definitions and properties*

2.4.2.4.1.1 Solid desensitized explosives are explosive substances which are wetted with water or alcohols or are diluted with other substances to form a homogeneous solid mixture to suppress their explosive properties. The desensitizing agent shall be distributed uniformly throughout the substance in the state in which it is to be transported. Where transport under conditions of low temperature is anticipated for substances containing or wetted with water, a suitable and compatible solvent, such as alcohol, may have to be added to lower the freezing point of the liquid. Some of these substances, when in a dry state, are classified as explosives. Where reference is made to a substance which is wetted with water, or some other liquid, it shall be permitted for transport as a class 4.1 substance only when in the wetted condition specified. Entries in the Dangerous Goods List in chapter 3.2 for solid desensitized explosives are UN 1310, UN 1320, UN 1321, UN 1322, UN 1336, UN 1337, UN 1344, UN 1347, UN 1348, UN 1349, UN 1354, UN 1355, UN 1356, UN 1357, UN 1517, UN 1571, UN 2555, UN 2556, UN 2557, UN 2852, UN 2907, UN 3317, UN 3319, UN 3344, UN 3364, UN 3365, UN 3366, UN 3367, UN 3368, UN 3369, UN 3370, UN 3376, UN 3380 and UN 3474.

2.4.2.4.2 Substances that:

.1 have been provisionally accepted into class 1 according to Test Series 1 and 2 but exempted from class 1 by Test Series 6;

.2 are not self-reactive substances of class 4.1;

.3 are not substances of class 5

are also assigned to class 4.1. UN 2956, UN 3241, UN 3242 and UN 3251 are such entries.

2.4.3 Class 4.2 – Substances liable to spontaneous combustion

2.4.3.1 Definitions and properties

2.4.3.1.1 Class 4.2 comprises:

.1 *Pyrophoric substances*, which are substances, including mixtures and solutions (liquid or solid), which, even in small quantities, ignite within 5 minutes of coming into contact with air. These substances are the most liable to spontaneous combustion; and

.2 *Self-heating substances*, which are substances, other than pyrophoric substances, which, in contact with air without energy supply, are liable to self-heating. These substances will ignite only when in large amounts (kilograms) and after long periods of time (hours or days).

2.4.3.1.2 Self-heating of a substance is a process where the gradual reaction of that substance with oxygen (in air) generates heat. If the rate of heat production exceeds the rate of heat loss, then the temperature of the substance will rise which, after an induction time, may lead to self-ignition and combustion.

2.4.3.1.3 Some substances may also give off toxic gases if involved in a fire.

2.4.3.2 Classification of class 4.2 substances

2.4.3.2.1 Solids are considered pyrophoric solids which shall be classified in class 4.2 if, in tests performed in accordance with the test method given in the United Nations *Manual of Tests and Criteria*, part III, 33.3.1.4, the sample ignites in one of the tests.

2.4.3.2.2 Liquids are considered pyrophoric liquids which shall be classified in class 4.2 if, in tests performed in accordance with the test method given in the United Nations *Manual of Tests and Criteria*, part III, 33.3.1.5, the liquid ignites in the first part of the test, or if it ignites or chars the filter paper.

2.4.3.2.3 ***Self-heating substances***

2.4.3.2.3.1 A substance shall be classified as a self-heating substance of class 4.2 if, in tests performed in accordance with the test method given in the United Nations *Manual of Tests and Criteria*, part III, 33.3.1.6:

.1 a positive result is obtained using a 25 mm cube sample at 140°C;

.2 a positive result is obtained in a test using a 100 mm cube sample at 140°C and a negative result is obtained in a test using a 100 mm cube sample at 120°C and the substance is to be transported in packages with a volume of more than 3 m^3;

.3 a positive result is obtained in a test using a 100 mm cube sample at 140°C and a negative result is obtained in a test using a 100 mm cube sample at 100°C and the substance is to be transported in packages with a volume of more than 450 ℓ;

.4 a positive result is obtained in a test using a 100 mm cube sample at 140°C and a positive result is obtained using a 100 mm cube sample at 100°C.

Note: Self-reactive substances, except for type G, giving also a positive result with this test method shall not be classified in class 4.2 but in class 4.1 (see 2.4.2.3.1.1).

2.4.3.2.3.2 A substance shall not be classified in class 4.2 if:

.1 a negative result is obtained in a test using a 100 mm cube sample at 140°C;

.2 a positive result is obtained in a test using a 100 mm cube sample at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°C, a negative result is obtained in a test using a 100 mm cube sample at 120°C and the substance is to be transported in packages with a volume not more than 3 m^3;

.3 a positive result is obtained in a test using a 100 mm cube sample at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°C, a negative result is obtained in a test using a 100 mm cube sample at 100°C and the substance is to be transported in packages with a volume not more than 450 ℓ.

2.4.3.3 Assignment of packing groups

2.4.3.3.1 Packing group I shall be assigned to all pyrophoric solids and liquids.

2.4.3.3.2 Packing group II shall be assigned to self-heating substances which give a positive result in a test using a 25 mm cube sample at 140°C.

2.4.3.3.3 Packing group III shall be assigned to self-heating substances if:

.1 a positive result is obtained in a test using a 100 mm cube sample at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°C and the substance is to be transported in packages with a volume of more than 3 m^3;

.2 a positive result is obtained in a test using a 100 mm cube sample at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°C, a positive result is obtained in a test using a 100 mm cube sample at 120°C and the substance is to be transported in packages with a volume of more than 450 ℓ;

.3 a positive result is obtained in a test using a 100 mm cube sample at 140°C and a negative result is obtained in a test using a 25 mm cube sample at 140°C and a positive result is obtained in a test using a 100 mm cube sample at 100°C.

2.4.4 Class 4.3 – Substances which, in contact with water, emit flammable gases

2.4.4.1 Definitions and properties

2.4.4.1.1 For the purpose of this Code, the substances in this class are either liquids or solids which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.

2.4.4.1.2 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 2.4.4.2 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.

2.4.4.2 Classification of class 4.3 substances

2.4.4.2.1 Substances which, in contact with water, emit flammable gases shall be classified in class 4.3 if, in tests performed in accordance with the test method given in the United Nations *Manual of Tests and Criteria*, part III, 33.4.1:

.1 spontaneous ignition takes place in any step of the test procedure; or

.2 there is an evolution of a flammable gas at a rate greater than 1 litre per kilogram of the substance per hour.

2.4.4.3 Assignment of packing groups

2.4.4.3.1 Packing group I shall be assigned to any substance which reacts vigorously with water at ambient temperatures and demonstrates generally a tendency for the gas produced to ignite spontaneously, or 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.

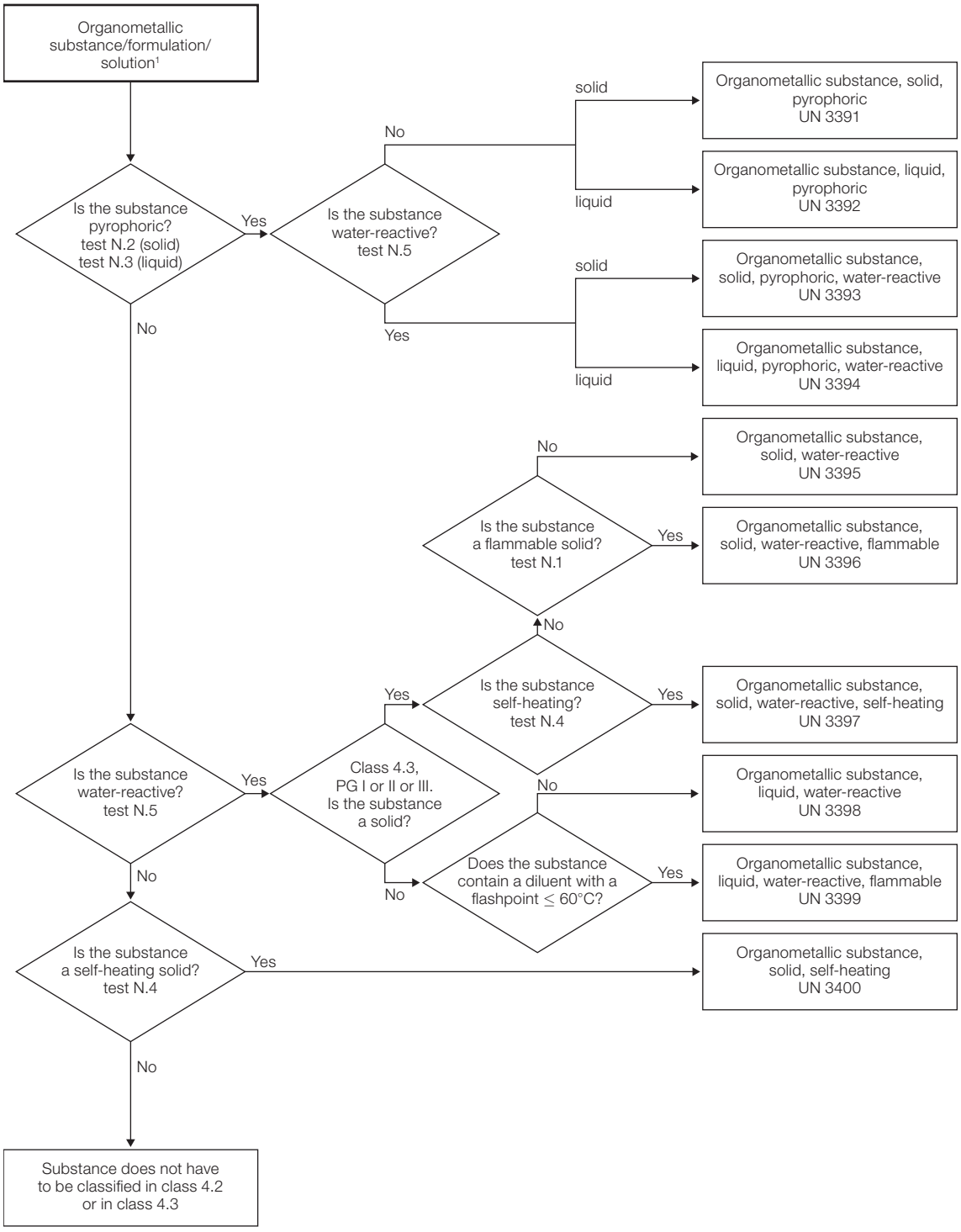
2.4.4.3.2 Packing group II shall be assigned to any substance which reacts readily with water at ambient temperatures such that the maximum rate of evolution of flammable gas is equal to or greater than 20 litres per kilogram of substance per hour, and which does not meet the criteria for packing group I.

2.4.4.3.3 Packing group III shall be assigned to any substance which reacts slowly with water at ambient temperatures such that the maximum rate of evolution of flammable gas is equal to or greater than 1 litre per kilogram of substance per hour, and which does not meet the criteria for packing groups I or II.

2.4.5 Classification of organometallic substances

Depending on their properties, organometallic substances may be classified in classes 4.2 or 4.3, as appropriate, in accordance with the following flowchart:

Flowchart scheme for organometallic substances[1,2]



[1] If applicable and testing is relevant, taking into account reactivity properties, class 6.1 and class 8 properties shall be considered according to the Precedence of hazards table 2.0.3.6.

[2] Test methods N.1 to N.5 can be found in the United Nations *Manual of Tests and Criteria*, part III, section 33.

Chapter 2.5

Class 5 – Oxidizing substances and organic peroxides

2.5.0 Introductory note

Note: Because of the differing properties exhibited by dangerous goods within classes 5.1 and 5.2, it is impracticable to establish a single criterion for classification in either class. Tests and criteria for assignment to the two classes are addressed in this chapter.

2.5.1 Definitions and general provisions

In this Code, class 5 is divided into two classes as follows:

Class 5.1 – Oxidizing substances

Substances which, while in themselves not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material. Such substances may be contained in an article;

Class 5.2 – Organic peroxides

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. Organic peroxides are thermally unstable substances which may undergo exothermic self-accelerating decomposition. In addition, they may have one or more of the following properties:

- be liable to explosive decomposition;
- burn rapidly;
- be sensitive to impact or friction;
- react dangerously with other substances;
- cause damage to the eyes.

2.5.2 Class 5.1 – Oxidizing substances

Note: For the classification of oxidizing substances to class 5.1, in the event of divergence between test results and known experience, judgement based on known experience shall take precedence over test results.

2.5.2.1 Properties

2.5.2.1.1 Substances of class 5.1 in certain circumstances directly or indirectly evolve oxygen. For this reason, oxidizing substances increase the risk and intensity of fire in combustible material with which they come into contact.

2.5.2.1.2 Mixtures of oxidizing substances with combustible material and even with material such as sugar, flour, edible oils, mineral oils, etc., are dangerous. These mixtures are readily ignited, in some cases by friction or impact. They may burn violently and may lead to explosion.

2.5.2.1.3 There will be a violent reaction between most oxidizing substances and liquid acids, evolving toxic gases. Toxic gases may also be evolved when certain oxidizing substances are involved in a fire.

2.5.2.1.4 The above-mentioned properties are, in general, common to all substances in this class. Additionally, some substances possess specific properties, which shall be taken into account in transport. These properties are shown in the Dangerous Goods List in chapter 3.2.

2.5.2.2 Oxidizing solids

2.5.2.2.1 *Classification of solid substances of class 5.1*

2.5.2.2.1.1 Tests are performed to measure the potential for the solid substance to increase the burning rate or burning intensity of a combustible substance when the two are thoroughly mixed. The procedure is given in the United Nations *Manual of Tests and Criteria*, part III, 34.4.1. Tests are conducted on the substance to be evaluated mixed with dry fibrous cellulose in mixing ratios of 1:1 and 4:1, by mass, of sample to cellulose. The burning characteristics of the mixtures are compared with the standard 3:7 mixture, by mass, of potassium bromate to cellulose. If the burning time is equal to or less than this standard mixture, the burning times shall be compared with those from the packing group I or II reference standards, 3:2 and 2:3 ratios, by mass, of potassium bromate to cellulose respectively.

2.5.2.2.1.2 The classification test results are assessed on the basis of:

.1 the comparison of the mean burning time with those of the reference mixtures; and

.2 whether the mixture of substance and cellulose ignites and burns.

2.5.2.2.1.3 A solid substance is classified in class 5.1 if 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.

2.5.2.2.2 *Assignment of packing groups*

2.5.2.2.2.1 Solid oxidizing substances are assigned to a packing group according to the test procedure in the United Nations *Manual of Tests and Criteria*, part III, 34.4.1, in accordance with the following criteria:

.1 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;

.2 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;

.3 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;

.4 Not classified as class 5.1: any substance which, in both the 4:1 and 1:1 sample-to-cellulose ratio (by mass) tested, does not ignite and burn, or exhibits mean burning times greater than that of a 3:7 mixture (by mass) of potassium bromate and cellulose.

2.5.2.3 Oxidizing liquids

2.5.2.3.1 *Classification of liquid substances of class 5.1*

2.5.2.3.1.1 A test is performed to determine the potential for a liquid substance to increase the burning rate or burning intensity of a combustible substance or for spontaneous ignition to occur when the two are thoroughly mixed. The procedure is given in the United Nations *Manual of Tests and Criteria*, part III, 34.4.2. It measures the pressure rise time during combustion. Whether a liquid is an oxidizing substance of class 5.1 and, if so, whether packing group I, II or III shall be assigned, is decided on the basis of the test result (see also Precedence of hazard characteristics in 2.0.3).

2.5.2.3.1.2 The classification test results are assessed on the basis of:

.1 whether the mixture of substance and cellulose spontaneously ignites;

.2 the comparison of the mean time taken for the pressure to rise from 690 kPa to 2070 kPa gauge with those of the reference substances.

2.5.2.3.1.3 A liquid substance is classified in class 5.1 if 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.

2.5.2.3.2 *Assignment of packing groups*

2.5.2.3.2.1 Liquid oxidizing substances are assigned to a packing group according to the test procedure in the United Nations *Manual of Tests and Criteria*, part III, 34.4.2, in accordance with the following criteria:

.1 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;

.2 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;

.3 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;

.4 Not classified as class 5.1: any substance which, in the 1:1 mixture (by mass) of substance and cellulose tested, exhibits a pressure rise of less than 2070 kPa gauge; or exhibits a mean pressure rise time greater than the mean pressure rise time of a 1:1 mixture (by mass) of 65% aqueous nitric acid and cellulose.

2.5.3 Class 5.2 – Organic peroxides

2.5.3.1 Properties

2.5.3.1.1 Organic peroxides are liable to exothermic decomposition at normal or elevated temperatures. The decomposition can be initiated by heat, contact with impurities (such as 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 transport. 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.

2.5.3.1.2 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.

2.5.3.2 Classification of organic peroxides

2.5.3.2.1 Any organic peroxide shall be considered for classification in class 5.2, unless the organic peroxide formulation contains:

.1 not more than 1.0% available oxygen from the organic peroxides when containing not more than 1.0% hydrogen peroxide; or

.2 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:

$$16 \times \Sigma(n_i \times c_i / m_i)$$

where

n_i = number of peroxygen groups per molecule of organic peroxide *i*;

c_i = concentration (mass %) of organic peroxide *i*;

m_i = molecular mass of organic peroxide *i*.

2.5.3.2.2 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 may not be accepted for transport in the packaging in which it is tested, to type G, which is not subject to the provisions for organic peroxides of class 5.2. The classification of types B to F is directly related to the maximum quantity allowed in one packaging.

2.5.3.2.3 Organic peroxides permitted for transport in packagings are listed in 2.5.3.2.4, those permitted for transport in IBCs are listed in packing instruction IBC520 and those permitted for transport in portable tanks are listed in portable tank instruction T23. For each permitted substance listed, the generic entry of the Dangerous Goods List (UN 3101 to UN 3120) is assigned, appropriate subsidiary risks and remarks providing relevant transport information are given. The generic entries specify:

.1 organic peroxide type (B to F);

.2 physical state (liquid or solid); and

.3 temperature control, when required (see 2.5.3.4).

2.5.3.2.3.1 Mixtures of the listed formulations may be classified as the same type of organic peroxide as that of the most dangerous component and be transported under the conditions of transport 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, temperature control applied as required by 2.5.3.4.

2.5.3.2.4 List of currently assigned organic peroxides in packagings

Note: Packing Method codes "OP1" to "OP8" refer to packing methods in packing instruction P520. Peroxides to be transported shall fulfil the classification and the control and emergency temperatures (derived from the SADT) as listed. For substances permitted in IBCs, see packing instruction IBC520, and for those permitted in tanks, see portable tank instruction T23.

Number (generic entry)	ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%)(1)	Inert solid (%)	Water (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Subsidiary risks and remarks
3101	*tert*-BUTYL PEROXYACETATE	> 52 – 77	≥ 23				OP5			(3)
	1,1-DI-(*tert*-BUTYLPEROXY)CYCLOHEXANE	> 80 – 100					OP5			(3)
	1,1-DI-(*tert*-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	> 90 – 100					OP5			(3)
	METHYL ETHYL KETONE PEROXIDE(S)	see remark (8)	≥ 48				OP5			(3) (8) (13)
	2,5-DIMETHYL-2,5-DI-(*tert*-BUTYLPEROXY)-HEXYNE-3	> 86 – 100					OP5			(3)
3102	*tert*-BUTYL MONOPEROXYMALEATE	> 52 – 100					OP5			(3)
	3-CHLOROPEROXYBENZOIC ACID	> 57 – 86			≥ 14		OP1			(3)
	DIBENZOYL PEROXIDE	> 51 – 100			≤ 48		OP2			(3)
	DIBENZOYL PEROXIDE	> 77 – 94				≥ 6	OP4			(3)
	DI-4-CHLOROBENZOYL PEROXIDE	≤ 77				≥ 23	OP5			(3)
	DI-2,4-DICHLOROBENZOYL PEROXIDE	≤ 77				≥ 23	OP5			(3)
	2,2-DIHYDROPEROXYPROPANE	≤ 27			≥ 73		OP5			(3)
	2,5-DIMETHYL-2,5-DI-(BENZOYLPEROXY)HEXANE	> 82 – 100					OP5			(3)
	DI-(2-PHENOXYETHYL) PEROXYDICARBONATE	> 85 – 100					OP5			(3)
	DISUCCINIC ACID PEROXIDE	> 72 – 100					OP4			(3) (17)
3103	*tert*-AMYL PEROXYBENZOATE	≤ 100					OP5			
	tert-AMYLPEROXY ISOPROPYL CARBONATE	≤ 77	≥ 23				OP5			
	n-BUTYL 4,4-DI-(*tert*-BUTYLPEROXY)VALERATE	> 52 – 100					OP5			
	tert-BUTYL HYDROPEROXIDE	> 79 – 90				≥ 10	OP5			(13)
	tert-BUTYL HYDROPEROXIDE + DI-*tert*-BUTYL PEROXIDE	< 82 + > 9				≥ 7	OP5			(13)
	tert-BUTYL MONOPEROXYMALEATE	≤ 52	≥ 48				OP6			
	tert-BUTYL PEROXYACETATE	> 32 – 52	≥ 48				OP6			
	tert-BUTYL PEROXYBENZOATE	> 77 – 100					OP5			
	tert-BUTYLPEROXY ISOPROPYLCARBONATE	≤ 77	≥ 23				OP5			
	tert-BUTYLPEROXY-2-METHYLBENZOATE	≤ 100					OP5			
	1,1-DI-(*tert*-AMYLPEROXY)CYCLOHEXANE	≤ 82	≥ 18				OP6			

Number (generic entry)	ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%)(1)	Inert solid (%)	Water (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Subsidiary risks and remarks
3103 *(cont.)*	2,2-DI-(*tert*-BUTYLPEROXY)BUTANE	≤ 52	≥ 48				OP6			
	1,6-DI-(*tert*-BUTYLPEROXYCARBONYLOXY)-HEXANE	≤ 72	≥ 28				OP5			
	1,1-DI-(*tert*-BUTYLPEROXY)CYCLOHEXANE	> 52 – 80	≥ 20				OP5			
	1,1-DI-(*tert*-BUTYLPEROXY)CYCLOHEXANE	≤ 72		≥ 28			OP5			(30)
	1,1-DI-(*tert*-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	> 57 – 90	≥ 10				OP5			
	1,1-DI-(*tert*-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	≤ 77		≥ 23			OP5			
	1,1-DI-(*tert*-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	≤ 90		≥ 10			OP5			(30)
	2,5-DIMETHYL-2,5-DI-(*tert*-BUTYLPEROXY)HEXANE	> 90 – 100					OP5			
	2,5-DIMETHYL-2,5-DI-(*tert*-BUTYLPEROXY)-HEXYNE-3	> 52 – 86	≥ 14				OP5			(26)
	ETHYL 3,3-DI-(*tert*-BUTYLPEROXY)BUTYRATE	> 77 – 100					OP5			
	ORGANIC PEROXIDE, LIQUID, SAMPLE						OP2			(11)
3104	CYCLOHEXANONE PEROXIDE(S)	≤ 91				≥ 9	OP6			(13)
	DIBENZOYL PEROXIDE	≤ 77				≥ 23	OP6			
	2,5-DIMETHYL-2,5-DI(BENZOYLPEROXY)HEXANE	≤ 82				≥ 18	OP5			
	2,5-DIMETHYL-2,5-DIHYDROPEROXYHEXANE	≤ 82				≥ 18	OP6			
	ORGANIC PEROXIDE, SOLID, SAMPLE						OP2			(11)
3105	ACETYL ACETONE PEROXIDE	≤ 42	≥ 48			≥ 8	OP7			(2)
	tert-AMYL PEROXYACETATE	≤ 62	≥ 38				OP7			
	tert-AMYL PEROXY-2-ETHYLHEXYL CARBONATE	≤ 100					OP7			
	tert-AMYL PEROXY-3,5,5-TRIMETHYLHEXANOATE	≤ 100					OP7			
	tert-BUTYL HYDROPEROXIDE	≤ 80	≥ 20				OP7			(4) (13)
	tert-BUTYL PEROXYBENZOATE	> 52 – 77	≥ 23				OP7			
	tert-BUTYL PEROXYBUTYL FUMARATE	≤ 52	≥ 48				OP7			
	tert-BUTYL PEROXYCROTONATE	≤ 77	≥ 23				OP7			
	tert-BUTYL PEROXY-2-ETHYLHEXYLCARBONATE	≤ 100					OP7			
	1-(2-*tert*-BUTYLPEROXY ISOPROPYL)-3-ISOPROPENYLBENZENE	≤ 77	≥ 23				OP7			
	tert-BUTYL PEROXY-3,5,5-TRIMETHYLHEXANOATE	> 32 – 100					OP7			
	CYCLOHEXANONE PEROXIDE(S)	≤ 72	≥ 28				OP7			(5)

Number (generic entry)	ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%)(1)	Inert solid (%)	Water (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Subsidiary risks and remarks
3105 *(cont.)*	2,2-DI-(*tert*-AMYLPEROXY)BUTANE	≤ 57	≥ 43				OP7			
	DI-*tert*-BUTYL PEROXYAZELATE	≤ 52	≥ 48				OP7			
	1,1-DI-(*tert*-BUTYLPEROXY)CYCLOHEXANE	> 42 – 52	≥ 48				OP7			
	1,1-DI-(*tert*-BUTYLPEROXY)CYCLOHEXANE + *tert*-BUTYL PEROXY-2-ETHYLHEXANOATE	≤ 43 + ≤ 16	≥ 41				OP7			
	DI-(*tert*-BUTYLPEROXY)PHTHALATE	> 42 – 52	≥ 48				OP7			
	2,2-DI-(*tert*-BUTYLPEROXY)PROPANE	≤ 52	≥ 48				OP7			
	2,5-DIMETHYL-2,5-DI-(*tert*-BUTYLPEROXY)HEXANE	> 52 – 90	≥ 10				OP7			
	2,5-DIMETHYL-2,5-DI-(3,5,5-TRIMETHYL-HEXANOYLPEROXY)HEXANE	≤ 77	≥ 23				OP7			
	ETHYL 3,3-DI-(*tert*-AMYLPEROXY)BUTYRATE	≤ 67	≥ 33				OP7			
	ETHYL 3,3-DI-(*tert*-BUTYLPEROXY)BUTYRATE	≤ 77	≥ 23				OP7			
	p-MENTHYL HYDROPEROXIDE	> 72 – 100					OP7			(13)
	METHYL ETHYL KETONE PEROXIDE(S)	see remark (9)	≥ 55				OP7			(9)
	METHYL ISOBUTYL KETONE PEROXIDE(S)	≤ 62	≥ 19				OP7			(22)
	PEROXYACETIC ACID, TYPE D, stabilized	≤ 43					OP7			(13) (14) (19)
	PINANYL HYDROPEROXIDE	> 56 – 100					OP7			(13)
	1,1,3,3-TETRAMETHYLBUTYL HYDROPEROXIDE	≤ 100					OP7			
	3,6,9-TRIETHYL-3,6,9-TRIMETHYL-1,4,7-TRIPEROXONANE	≤ 42	≥ 58				OP7			(28)
3106	ACETYL ACETONE PEROXIDE	≤ 32 as a paste					OP7			(20)
	tert-BUTYL PEROXYBENZOATE	≤ 52			≥ 48		OP7			
	tert-BUTYL PEROXY-2-ETHYLHEXANOATE + 2,2-DI-(*tert*-BUTYLPEROXY)BUTANE	≤ 12 + ≤ 14	≥ 14		≥ 60		OP7			
	tert-BUTYLPEROXY STEARYLCARBONATE	≤ 100					OP7			
	tert-BUTYL PEROXY-3,5,5-TRIMETHYLHEXANOATE	≤ 42			≥ 58		OP7			
	3-CHLOROPEROXYBENZOIC ACID	≤ 57			≥ 3	≥ 40	OP7			
	3-CHLOROPEROXYBENZOIC ACID	≤ 77			≥ 6	≥ 17	OP7			
	CYCLOHEXANONE PEROXIDE(S)	≤ 72 as a paste					OP7			(5) (20)
	DIBENZOYL PEROXIDE	≤ 62			≥ 28	≥ 10	OP7			
	DIBENZOYL PEROXIDE	> 52 – 62 as a paste					OP7			(20)
	DIBENZOYL PEROXIDE	> 35 – 52			≥ 48		OP7			

Number (generic entry)	ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%)(1)	Inert solid (%)	Water (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Subsidiary risks and remarks
3106 *(cont.)*	1,1-DI-(*tert*-BUTYLPEROXY)CYCLOHEXANE	≤ 42	≥ 13		≥ 45		OP7			
	DI-(*tert*-BUTYLPEROXYISOPROPYL)BENZENE(S)	> 42 – 100			≤ 57		OP7			
	DI-(*tert*-BUTYLPEROXY)PHTHALATE	≤ 52 as a paste					OP7			(20)
	2,2-DI-(*tert*-BUTYLPEROXY)PROPANE	≤ 42	≥ 13		≥ 45		OP7			
	DI-4-CHLOROBENZOYL PEROXIDE	≤ 52 as a paste					OP7			(20)
	2,2-DI-(4,4-DI-(*tert*-BUTYLPEROXY) CYCLOHEXYL)-PROPANE	≤ 42			≥ 58		OP7			
	DI-2,4-DICHLOROBENZOYL PEROXIDE	≤ 52 as a paste with silicon oil					OP7			
	DI-(1-HYDROXYCYCLOHEXYL)PEROXIDE	≤ 100					OP7			
	DIISOPROPYLBENZENE DIHYDROPEROXIDE	≤ 82	≥ 5			≥ 5	OP7			(24)
	DILAUROYL PEROXIDE	≤ 100					OP7			
	DI-(4-METHYLBENZOYL) PEROXIDE	≤ 52 as paste with silicon oil					OP7			
	2,5-DIMETHYL-2,5-DI-(BENZOYLPEROXY)HEXANE	≤ 82			≥ 18		OP7			
	2,5-DIMETHYL-2,5-DI-(*tert*-BUTYLPEROXY)-HEXYNE-3	≤ 52			≥ 48		OP7			
	DI-(2-PHENOXYETHYL)PEROXYDICARBONATE	≤ 85				≥ 15	OP7			
	ETHYL 3,3-DI-(*tert*-BUTYLPEROXY)BUTYRATE	≤ 52			≥ 48		OP7			
	([3R-3R,5aS,6S,8aS,9R,10R,12S,12aR**)]-DECAHYDRO-10-METHOXY-3,6,9-TRIMETHYL-3,12-EPOXY-12H-PYRANO[4,3-j]-1,2-BENZODIOXEPIN)	≤ 100					OP7			
3107	*tert*-AMYL HYDROPEROXIDE	≤ 88	≥ 6			≥ 6	OP8			
	tert-BUTYL CUMYL PEROXIDE	> 42 – 100					OP8			
	tert-BUTYL HYDROPEROXIDE	≤ 79				> 14	OP8			(13) (23)
	CUMYL HYDROPEROXIDE	> 90 – 98	≤ 10				OP8			(13)
	DI-*tert*-AMYL PEROXIDE	≤ 100					OP8			
	DIBENZOYL PEROXIDE	> 36 – 42	≥ 18			≤ 40	OP8			
	DI-*tert*-BUTYL PEROXIDE	> 52 – 100					OP8			
	1,1-DI-(*tert*-BUTYLPEROXY)CYCLOHEXANE	≤ 27	≥ 25				OP8			(21)
	DI-(*tert*-BUTYLPEROXY)PHTHALATE	≤ 42	≥ 58				OP8			
	1,1-DI-(*tert*-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	≤ 57	≥ 43				OP8			

Number (generic entry)	ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%)(1)	Inert solid (%)	Water (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Subsidiary risks and remarks
3107 *(cont.)*	1,1-DI-(*tert*-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	≤ 32	≥ 26	≥ 42			OP8			
	2,2-DI-(4,4-DI-(*tert*-BUTYLPEROXY) CYCLOHEXYL)-PROPANE	≤ 22		≥ 78			OP8			
	METHYL ETHYL KETONE PEROXIDE(S)	see remark (10)	≥ 60				OP8			(10)
	3,3,5,7,7-PENTAMETHYL-1,2,4-TRIOXEPANE	≤ 100					OP8			
	PEROXYACETIC ACID, TYPE E, stabilized	≤ 43					OP8			(13) (15) (19)
	POLYETHER POLY-*tert*-BUTYLPEROXY-CARBONATE	≤ 52		≥ 48			OP8			
3108	*tert*-BUTYL CUMYL PEROXIDE	≤ 52			≥ 48		OP8			
	n-BUTYL 4,4-DI-(*tert*-BUTYLPEROXY)VALERATE	≤ 52			≥ 48		OP8			
	tert-BUTYL MONOPEROXYMALEATE	≤ 52			≥ 48		OP8			
	tert-BUTYL MONOPEROXYMALEATE	≤ 52 as a paste					OP8			
	1-(2-*tert*-BUTYLPEROXYISOPROPYL)-3-ISOPROPENYLBENZENE	≤ 42			≥ 58		OP8			
	DIBENZOYL PEROXIDE	≤ 56.5 as a paste				≥ 15	OP8			
	DIBENZOYL PEROXIDE	≤ 52 as a paste					OP8			(20)
	2,5-DIMETHYL-2,5-DI-(*tert*-BUTYLPEROXY)HEXANE	≤ 47 as a paste					OP8			
	2,5-DIMETHYL-2,5-DI-(*tert*-BUTYLPEROXY)HEXANE	≤ 77			≥ 23		OP8			
3109	*tert*-BUTYL HYDROPEROXIDE	≤ 72				≥ 28	OP8			(13)
	tert-BUTYL PEROXYACETATE	≤ 32		≥ 68			OP8			
	tert-BUTYL PEROXY-3,5,5-TRIMETHYL-HEXANOATE	≤ 32		≥ 68			OP8			
	CUMYL HYDROPEROXIDE	≤ 90	≥ 10				OP8			(13) (18)
	DIBENZOYL PEROXIDE	≤ 42 as a stable dispersion in water					OP8			
	DI-*tert*-BUTYL PEROXIDE	≤ 52		≥ 48			OP8			(25)
	1,1-DI-(*tert*-BUTYLPEROXY)CYCLOHEXANE	≤ 42	≥ 58				OP8			
	1,1-DI-(*tert*-BUTYLPEROXY)CYCLOHEXANE	≤ 13	≥ 13	≥ 74			OP8			
	DILAUROYL PEROXIDE	≤ 42 as a stable dispersion in water					OP8			
	2,5-DIMETHYL-2,5-DI-(*tert*-BUTYLPEROXY)HEXANE	≤ 52	≥ 48				OP8			
	ISOPROPYLCUMYL HYDROPEROXIDE	≤ 72	≥ 28				OP8			(13)
	p-MENTHYL HYDROPEROXIDE	≤ 72	≥ 28				OP8			(27)
	METHYL ISOPROPYL KETONE PEROXIDE(S)	See remark (31)	≥ 70				OP8			(31)
	PEROXYACETIC ACID, TYPE F, stabilized	≤ 43					OP8			(13) (16) (19)

Number (generic entry)	ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%)(1)	Inert solid (%)	Water (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Subsidiary risks and remarks
3109 *(cont.)*	PINANYL HYDROPEROXIDE	≤ 56	≥ 44				OP8			
3110	DICUMYL PEROXIDE	> 52 – 100					OP8			(12)
	1,1-DI-(*tert*-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	≤ 57			≥ 43		OP8			
	3,6,9-TRIETHYL-3,6,9-TRIMETHYL-1,4,7-TRIPEROXONANE	≤ 17	≥ 18		≥ 65		OP8			
3111	*tert*-BUTYL PEROXYISOBUTYRATE	> 52 – 77		≥ 23			OP5	+15	+20	(3)
	DIISOBUTYRYL PEROXIDE	> 32 – 52		≥ 48			OP5	–20	–10	(3)
	ISOPROPYL *sec*-BUTYL PEROXYDICARBONATE + DI-*sec*-BUTYL PEROXYDICARBONATE + DIISOPROPYL PEROXYDICARBONATE	≤ 52 + ≤ 28 + ≤ 22					OP5	–20	–10	(3)
3112	ACETYL CYCLOHEXANESULPHONYL PEROXIDE	≤ 82				≥ 12	OP4	–10	0	(3)
	DICYCLOHEXYL PEROXYDICARBONATE	> 91 – 100					OP3	+10	+15	(3)
	DIISOPROPYL PEROXYDICARBONATE	> 52 – 100					OP2	–15	–5	(3)
	DI-(2-METHYLBENZOYL) PEROXIDE	≤ 87				≥ 13	OP5	+30	+35	(3)
3113	*tert*-AMYL PEROXYPIVALATE	≤ 77		≥ 23			OP5	+10	+15	
	tert-BUTYL PEROXYDIETHYLACETATE	≤ 100					OP5	+20	+25	
	tert-BUTYL PEROXY-2-ETHYLHEXANOATE	> 52 – 100					OP6	+20	+25	
	tert-BUTYL PEROXYPIVALATE	> 67 – 77	≥ 23				OP5	0	+10	
	DI-*sec*-BUTYL PEROXYDICARBONATE	> 52 – 100					OP4	–20	–10	
	DI-(2-ETHYLHEXYL)PEROXYDICARBONATE	> 77 – 100					OP5	–20	–10	
	2,5-DIMETHYL-2,5-DI-(2-ETHYLHEXANOYLPEROXY)-HEXANE	≤ 100					OP5	+20	+25	
	DI-*n*-PROPYL PEROXYDICARBONATE	≤ 100					OP3	–25	–15	
	DI-*n*-PROPYL PEROXYDICARBONATE	≤ 77		≥ 23			OP5	–20	–10	
	ORGANIC PEROXIDE, LIQUID, SAMPLE, TEMPERATURE CONTROLLED						OP2			(11)
3114	DI-(4-*tert*-BUTYLCYCLOHEXYL)-PEROXYDICARBONATE	≤ 100					OP6	+30	+35	
	DICYCLOHEXYL PEROXYDICARBONATE	≤ 91				≥ 9	OP5	+10	+15	
	DIDECANOYL PEROXIDE	≤ 100					OP6	+30	+35	
	DI-*n*-OCTANOYL PEROXIDE	≤ 100					OP5	+10	+15	
	ORGANIC PEROXIDE, SOLID, SAMPLE, TEMPERATURE CONTROLLED						OP2			(11)
3115	ACETYL CYCLOHEXANESULPHONYL PEROXIDE	≤ 32		≥ 68			OP7	–10	0	

Number (generic entry)	ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%)(1)	Inert solid (%)	Water (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Subsidiary risks and remarks
3115 *(cont.)*	*tert*-AMYL PEROXY-2-ETHYLHEXANOATE	≤ 100					OP7	+20	+25	
	tert-AMYL PEROXYNEODECANOATE	≤ 77		≥ 23			OP7	0	+10	
	tert-BUTYL PEROXY-2-ETHYLHEXANOATE + 2,2-DI-(*tert*-BUTYLPEROXY)BUTANE	≤ 31 + ≤ 36		≥ 33			OP7	+35	+40	
	tert-BUTYL PEROXYISOBUTYRATE	≤ 52		≥ 48			OP7	+15	+20	
	tert-BUTYL PEROXYNEODECANOATE	> 77 – 100					OP7	–5	+5	
	tert-BUTYL PEROXYNEODECANOATE	≤ 77		≥ 23			OP7	0	+10	
	tert-BUTYL PEROXYNEOHEPTANOATE	≤ 77	≥ 23				OP7	0	+10	
	tert-BUTYL PEROXYPIVALATE	> 27 – 67		≥ 33			OP7	0	+10	
	CUMYL PEROXYNEODECANOATE	≤ 77		≥ 23			OP7	–10	0	
	CUMYL PEROXYNEODECANOATE	≤ 87	≥ 13				OP7	–10	0	
	CUMYL PEROXYNEOHEPTANOATE	≤ 77	≥ 23				OP7	–10	0	
	CUMYL PEROXYPIVALATE	≤ 77		≥ 23			OP7	–5	+5	
	DIACETONE ALCOHOL PEROXIDES	≤ 57		≥ 26		≥ 8	OP7	+40	+45	(6)
	DIACETYL PEROXIDE	≤ 27		≥ 73			OP7	+20	+25	(7) (13)
	DI-*n*-BUTYL PEROXYDICARBONATE	> 27 – 52		≥ 48			OP7	–15	–5	
	DI-*sec*-BUTYL PEROXYDICARBONATE	≤ 52		≥ 48			OP7	–15	–5	
	DI-(2-ETHOXYETHYL)PEROXYDICARBONATE	≤ 52		≥ 48			OP7	–10	0	
	DI-(2-ETHYLHEXYL)PEROXYDICARBONATE	≤ 77		≥ 23			OP7	–15	–5	
	DIISOBUTYRYL PEROXIDE	≤ 32		≥ 68			OP7	–20	–10	
	DIISOPROPYL PEROXYDICARBONATE	≤ 52		≥ 48			OP7	–20	–10	
	DIISOPROPYL PEROXYDICARBONATE	≤ 32	≥ 68				OP7	–15	–5	
	DI-(3-METHOXYBUTYL) PEROXYDICARBONATE	≤ 52		≥ 48			OP7	–5	+5	
	DI-(3-METHYLBENZOYL) PEROXIDE + BENZOYL (3-METHYLBENZOYL) PEROXIDE + DIBENZOYL PEROXIDE	≤ 20 + ≤ 18 + ≤ 4		≥ 58			OP7	+35	+40	
	DI-(2-NEODECANOYLPEROXYISOPROPYL)-BENZENE	≤ 52	≥ 48				OP7	–10	0	
	DI-(3,5,5-TRIMETHYLHEXANOYL) PEROXIDE	> 52 – 82	≥ 18				OP7	0	+10	
	1-(2-ETHYLHEXANOYLPEROXY)-1,3-DIMETHYLBUTYL PEROXYPIVALATE	≤ 52	≥ 45	≥ 10			OP7	–20	–10	
	tert-HEXYL PEROXYNEODECANOATE	≤ 71	≥ 29				OP7	0	+10	
	tert-HEXYL PEROXYPIVALATE	≤ 72		≥ 28			OP7	+10	+15	

Number (generic entry)	ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%)(1)	Inert solid (%)	Water (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Subsidiary risks and remarks
3115 *(cont.)*	3-HYDROXY-1,1-DIMETHYLBUTYL PEROXYNEODECANOATE	≤ 77	≥ 23				OP7	–5	+ 5	
	ISOPROPYL *sec*-BUTYL PEROXYDICARBONATE + DI-*sec*-BUTYL PEROXYDICARBONATE + DI-ISOPROPYL PEROXYDICARBONATE	≤ 32 + ≤ 15 – 18 + ≤ 12 – 15	≥ 38				OP7	–20	–10	
	METHYLCYCLOHEXANONE PEROXIDE(S)	≤ 67		≥ 33			OP7	+35	+40	
	1,1,3,3-TETRAMETHYLBUTYL PEROXY-2-ETHYLHEXANOATE	≤ 100					OP7	+15	+20	
	1,1,3,3-TETRAMETHYLBUTYL PEROXY-NEODECANOATE	≤ 72		≥ 28			OP7	–5	+5	
	1,1,3,3-TETRAMETHYLBUTYL PEROXYPIVALATE	≤ 77	≥ 23				OP7	0	+10	
3116	DICETYL PEROXYDICARBONATE	≤ 100					OP7	+30	+35	
	DIMYRISTYL PEROXYDICARBONATE	≤ 100					OP7	+20	+25	
	DI-*n*-NONANOYL PEROXIDE	≤ 100					OP7	0	+10	
	DISUCCINIC ACID PEROXIDE	≤ 72				≥ 28	OP7	+10	+15	
3117	*tert*-BUTYL PEROXY-2-ETHYLHEXANOATE	> 32 – 52		≥ 48			OP8	+30	+35	
	DI-*n*-BUTYL PEROXYDICARBONATE	≤ 27		≥ 73			OP8	–10	0	
	tert-BUTYL PEROXYNEOHEPTANOATE	≤ 42 as a stable dispersion in water					OP8	0	+10	
	1,1-DIMETHYL-3-HYDROXYBUTYL PEROXY-NEOHEPTANOATE	≤ 52	≥ 48				OP8	0	+10	
	DIPROPIONYL PEROXIDE	≤ 27		≥ 73			OP8	+15	+20	
	3-HYDROXY-1,1-DIMETHYLBUTYL PEROXY-NEODECANOATE	≤ 52	≥ 48				OP8	–5	+5	
3118	*tert*-BUTYL PEROXY-2-ETHYLHEXANOATE	≤ 52			≥ 48		OP8	+20	+25	
	tert-BUTYL PEROXYNEODECANOATE	≤ 42 as a stable dispersion in water (frozen)					OP8	0	+10	
	DI-*n*-BUTYL PEROXYDICARBONATE	≤ 42 as a stable dispersion in water (frozen)					OP8	–15	–5	
	DI-2,4-DICHLOROBENZOYL PEROXIDE	≤ 52 as a paste					OP8	+ 20	+ 25	
	PEROXYLAURIC ACID	≤ 100					OP8	+35	+40	
3119	*tert*-AMYL PEROXYNEODECANOATE	≤ 47	≥ 53				OP8	0	+ 10	
	tert-BUTYL PEROXY-2-ETHYLHEXANOATE	≤ 32		≥ 68			OP8	+40	+45	
	tert-BUTYL PEROXYNEODECANOATE	≤ 52 as a stable dispersion in water					OP8	0	+10	

Number (generic entry)	ORGANIC PEROXIDE	Concentration (%)	Diluent type A (%)	Diluent type B (%)(1)	Inert solid (%)	Water (%)	Packing method	Control temperature (°C)	Emergency temperature (°C)	Subsidiary risks and remarks
3119 *(cont.)*	*tert*-BUTYL PEROXYNEODECANOATE	≤ 32	≥ 68				OP8	0	+10	
	tert-BUTYL PEROXYPIVALATE	≤ 27		≥ 73			OP8	+30	+35	
	CUMYL PEROXYNEODECANOATE	≤ 52 as a stable dispersion in water					OP8	–10	0	
	DI-(4-*tert*-BUTYLCYCLOHEXYL) PEROXYDICARBONATE	≤ 42 as a stable dispersion in water					OP8	+30	+35	
	DICETYL PEROXYDICARBONATE	≤ 42 as a stable dispersion in water					OP8	+30	+35	
	DICYCLOHEXYL PEROXYDICARBONATE	≤ 42 as a stable dispersion in water					OP8	+15	+20	
	DI-(2-ETHYLHEXYL) PEROXYDICARBONATE	≤ 62 as a stable dispersion in water					OP8	–15	–5	
	DIMYRISTYL PEROXYDICARBONATE	≤ 42 as a stable dispersion in water					OP8	+20	+25	
	DI-(3,5,5-TRIMETHYLHEXANOYL) PEROXIDE	≤ 52 as a stable dispersion in water					OP8	+10	+15	
	DI-(3,5,5-TRIMETHYLHEXANOYL) PEROXIDE	≤ 38	≥ 62				OP8	+20	+25	
	DI-(3,5,5-TRIMETHYLHEXANOYL) PEROXIDE	> 38 – 52	≥ 48				OP8	+10	+15	
	3-HYDROXY-1,1-DIMETHYLBUTYL PEROXYNEODECANOATE	≤ 52 as a stable dispersion in water					OP 8	–5	+ 5	
	1,1,3,3-TETRAMETHYLBUTYL PEROXYNEODECANOATE	≤ 52 as a stable dispersion in water					OP8	–5	+5	
3120	DI-(2-ETHYLHEXYL)PEROXYDICARBONATE	≤ 52 as a stable dispersion in water (frozen)					OP8	–15	–5	
Exempt	CYCLOHEXANONE PEROXIDE(S)	≤ 32			≥ 68					(29)
Exempt	DIBENZOYL PEROXIDE	≤ 35			≥ 65					(29)
Exempt	DI-(2-*tert*-BUTYLPEROXYISOPROPYL)BENZENE(S)	≤ 42			≥ 58					(29)
Exempt	DI-4-CHLOROBENZOYL PEROXIDE	≤ 32			≥ 68					(29)
Exempt	DICUMYL PEROXIDE	≤ 52			≥ 48					(29)

(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 ≤ 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 ≤ 9%
(6) With ≤ 9% hydrogen peroxide; available oxygen ≤ 10%
(7) Only non-metallic packagings are allowed
(8) Available oxygen > 10% and ≤ 10.7%, with or without water
(9) Available oxygen ≤ 10%, with or without water
(10) Available oxygen ≤ 8.2%, with or without water
(11) See 2.5.3.2.5.1
(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 2.5.3.3.2.4
(15) Peroxyacetic acid formulations which fulfil the criteria of 2.5.3.3.2.5
(16) Peroxyacetic acid formulations which fulfil the criteria of 2.5.3.3.2.6
(17) Addition of water to this organic peroxide will decrease its thermal stability
(18) No "CORROSIVE" subsidiary risk label 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 ≥ 25% diluent type A by mass, and in addition ethylbenzene
(22) With ≥ 19% diluent type A by mass, and in addition methyl isobutyl ketone
(23) With < 6% di-*tert*-butyl peroxide
(24) With ≤ 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 ≤ 7.6% in diluent type A having a 95% boil-off point in the range 200–260°C
(29) Not subject to the provisions for peroxide, class 5.2
(30) Diluent type B with boiling point > 130°C
(31) Active oxygen ≤ 6.7%

2.5.3.2.5 Classification of organic peroxides not listed in 2.5.3.2.4, packing instruction IBC520 or portable tank instruction T23 and assignment to a generic entry shall be made by the competent authority of the country of origin on the basis of a test report. Principles applying to the classification of such substances are provided in 2.5.3.3. Test methods and criteria and an example of a report are given in the current edition of the United Nations *Manual of Tests and Criteria*, part II. The statement of approval shall contain the classification and the relevant transport conditions (see 5.4.4.1.3).

2.5.3.2.5.1 Samples of new organic peroxides or new formulations of currently assigned organic peroxides for which complete test data are not available and which are to be transported for further testing or evaluation may be assigned to one of the appropriate entries for ORGANIC PEROXIDE TYPE C provided the following conditions are met:

.1 the available data indicate that the sample would be no more dangerous than ORGANIC PEROXIDE TYPE B;

.2 the sample is packaged in accordance with packing method OP2 and the quantity per cargo transport unit is limited to 10 kg; and

.3 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.

2.5.3.3 Principles for classification of organic peroxides

Note: This section refers only to those properties of organic peroxides which are decisive for their classification. A flow chart, presenting the classification principles in the form of a graphically arranged scheme of questions concerning the decisive properties together with the possible answers, is given in Figure 2.5.1 in chapter 2.5 of the United Nations *Recommendations on the Transport of Dangerous Goods*. These properties shall be determined experimentally. Suitable test methods with pertinent evaluation criteria are given in the United Nations *Manual of Tests and Criteria*, part II.

2.5.3.3.1 Any organic peroxide formulation shall be regarded as possessing explosive properties when, in laboratory testing, the formulation is liable to detonate, to deflagrate rapidly or to show a violent effect when heated under confinement.

2.5.3.3.2 The following principles apply to the classification of organic peroxide formulations not listed in 2.5.3.2.4:

.1 Any organic peroxide formulation which can detonate or deflagrate rapidly, as packaged for transport, is prohibited from transport in that packaging under class 5.2 (defined as ORGANIC PEROXIDE TYPE A);

.2 Any organic peroxide formulation possessing explosive properties and which, as packaged for transport, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package, shall bear an "EXPLOSIVE" subsidiary risk label (Model No. 1, see 5.2.2.2.2). Such an organic peroxide may be packaged in amounts of up to 25 kg unless the maximum quantity has to be limited to a lower amount to preclude detonation or rapid deflagration in the package (defined as ORGANIC PEROXIDE TYPE B);

.3 Any organic peroxide formulation possessing explosive properties may be transported without an "EXPLOSIVE" subsidiary risk label when the substance as packaged (maximum 50 kg) for transport cannot detonate or deflagrate rapidly or undergo a thermal explosion (defined as ORGANIC PEROXIDE TYPE C);

.4 Any organic peroxide formulation which, in laboratory testing:

.1 detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or

.2 does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or

.3 does not detonate or deflagrate at all and shows a medium effect when heated under confinement

is acceptable for transport in packages of not more than 50 kg net mass (defined as ORGANIC PEROXIDE TYPE D);

.5 Any organic peroxide formulation which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement is acceptable for transport in packages of not more than 400 kg/450 ℓ (defined as ORGANIC PEROXIDE TYPE E);

.6 Any organic peroxide formulation which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power may be considered for transport in IBCs or tanks (defined as ORGANIC PEROXIDE TYPE F); for additional provisions see 4.1.7 and 4.2.1.13;

.7 Any organic peroxide formulation which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement nor any explosive power shall be exempted from class 5.2, provided that the formulation is thermally stable (self-accelerating decomposition temperature is 60°C or higher for a 50 kg package) and for liquid formulations diluent type A is used for desensitization (defined as ORGANIC PEROXIDE TYPE G). If the formulation is not thermally stable or a diluent other than type A is used for desensitization, the formulation shall be defined as ORGANIC PEROXIDE TYPE F.

2.5.3.4 Temperature control provisions

2.5.3.4.0 The properties of some organic peroxides require that they be transported under temperature control. Control and emergency temperatures for currently assigned organic peroxides are shown in the list 2.5.3.2.4. The controlled temperature provisions are given in chapter 7.3.7.

2.5.3.4.1 The following organic peroxides shall be subjected to temperature control during transport:

.1 organic peroxides type B and C with a SADT $\leq$ 50°C;

.2 organic peroxides type D showing a medium effect when heated under confinement* with a SADT $\leq$ 50°C or showing a low or no effect when heated under confinement with a SADT $\leq$ 45°C; and

.3 organic peroxides types E and F with a SADT $\leq$ 45°C.

2.5.3.4.2 Test methods for determining the SADT are given in the United Nations *Manual of Tests and Criteria*, part II, chapter 28. The test selected shall be conducted in a manner which is representative, both in size and material, of the package to be transported.

2.5.3.4.3 Test methods for determining the flammability are given in the United Nations *Manual of Tests and Criteria*, part III, chapter 32.4. Because organic peroxides may react vigorously when heated, it is recommended to determine their flashpoint using small sample sizes such as described in ISO 3679.

2.5.3.5 Desensitization of organic peroxides

2.5.3.5.1 In order to ensure safety during transport, 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 or fire, the organic peroxide will not concentrate to a dangerous extent.

* As determined by test series E as prescribed in the United Nations *Manual of Tests and Criteria*, part II.

2.5.3.5.2 Unless otherwise stated for the individual organic peroxide formulation, the following definitions apply for diluents used for desensitization:

.1 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.

.2 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 flashpoint of not less than 5°C. Type B diluents may be used for desensitization of all organic peroxides provided that the boiling point is at least 60°C higher than the SADT in a 50 kg package.

2.5.3.5.3 Diluents, other than type A or type B, may be added to organic peroxide formulations as listed in 2.5.3.2.4 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.

2.5.3.5.4 Water may only be used for the desensitization of organic peroxides which are shown in 2.5.3.2.4 or in the statement of approval according to 2.5.3.2.5 as being with water or as a stable dispersion in water.

2.5.3.5.5 Organic and inorganic solids may be used for desensitization of organic peroxides provided that they are compatible.

2.5.3.5.6 Compatible liquids and solids are those which have no detrimental influence on the thermal stability and hazard type of the organic peroxide formulation.

Chapter 2.6

Class 6 – Toxic and infectious substances

2.6.0 Introductory notes

Note 1: The word "toxic" has the same meaning as "poisonous".

Note 2: Genetically modified microorganisms which do not meet the definition of a toxic or an infectious substance shall be considered for classification in class 9 and assigned to UN 3245.

Note 3: Toxins from plant, animal or bacterial sources which do not contain any infectious substances, or toxins that are contained in substances which are not infectious substances, shall be considered for classification in class 6.1 and assigned to UN 3172.

2.6.1 Definitions

Class 6 is subdivided into two classes as follows:

Class 6.1 – Toxic substances
These are substances liable either to cause death or serious injury or to harm human health if swallowed or inhaled, or by skin contact.

Class 6.2 – Infectious substances
These are substances known or 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.

2.6.2 Class 6.1 – Toxic substances

2.6.2.1 Definitions and properties

2.6.2.1.1 LD_{50} *(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 LD_{50} value is expressed in terms of mass of test substance per mass of test animal (mg/kg).

2.6.2.1.2 LD_{50} *for acute dermal toxicity* is that dose of the substance which, administered by continuous contact for 24 hours with the bare skin of the albino rabbit, 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 practices. The result is expressed in milligrams per kilogram body mass.

2.6.2.1.3 LC_{50} *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 the respirable range, such as the aerodynamic diameter of that particle fraction is 10 microns or less. A liquid substance shall be tested if a mist is likely to be generated in a leakage of the transport containment. For both solid and liquid substances, more than 90% (by mass) of a specimen prepared for inhalation toxicity testing 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.

2.6.2.1.4 *Properties*

.1 The dangers of poisoning which are inherent in these substances depend upon contact with the human body, that is by inhalation of vapours by unsuspecting persons at some distance from the cargo or the immediate dangers of physical contact with the substance. These have been considered in the context of the probability of accident occurring during transport by sea.

.2 Nearly all toxic substances evolve toxic gases when involved in a fire or when heated to decomposition.

.3 A substance specified as "stabilized" shall not be transported in an unstabilized condition.

2.6.2.2 Assignment of packing groups to toxic substances

2.6.2.2.1 Toxic substances have for packing purposes been apportioned among packing groups according to the degree of their toxic hazards in transport:

.1 Packing group I: substances and preparations presenting a high toxicity risk;

.2 Packing group II: substances and preparations presenting a medium toxicity risk;

.3 Packing group III: substances and preparations presenting a low toxicity risk.

2.6.2.2.2 In making this grouping, account has been taken of human experience in instances of accidental poisoning, and of special properties possessed by any individual substance, such as liquid state, high volatility, any special likelihood of penetration, and special biological effects.

2.6.2.2.3 In the absence of human experience, the grouping has been based on data obtained from animal experiments. Three possible routes of administration have been examined. These routes are exposure through:

- oral ingestion;
- dermal contact; and
- inhalation of dusts, mists or vapours.

2.6.2.2.3.1 For appropriate animal test data for the various routes of exposure, see 2.6.2.1. When a substance exhibits a different order of toxicity by two or more routes of administration, the highest degree of danger indicated by the tests has been used in assigning the packing group.

2.6.2.2.4 The criteria to be applied for grouping a substance according to the toxicity it exhibits by all three routes of administration are presented in the following paragraphs.

2.6.2.2.4.1 The grouping criteria for the oral and dermal routes as well as for inhalation of dusts and mists are shown in the following table:

Grouping criteria for administration through oral ingestion, dermal contact and inhalation of dusts and mists

Packing group	Oral toxicity LD_{50} (mg/kg)	Dermal toxicity LD_{50} (mg/kg)	Inhalation toxicity by dusts and mists LC_{50} (mg/ℓ)
I	$\leq$ 5.0	$\leq$ 50	$\leq$ 0.2
II	$>$ 5.0 and $\leq$ 50	$>$ 50 and $\leq$ 200	$>$ 0.2 and $\leq$ 2.0
III*	$>$ 50 and $\leq$ 300	$>$ 200 and $\leq$ 1000	$>$ 2.0 and $\leq$ 4.0

* Tear gas substances shall be included in packing group II even if their toxicity data correspond to packing group III values.

Note: Substances meeting the criteria of class 8 and with an inhalation toxicity of dusts and mists (LC_{50}) leading to packing group I are only 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 group I or II. Otherwise an allocation to class 8 is made when appropriate (see 2.8.2.3).

2.6.2.2.4.2 The criteria for inhalation toxicity of dusts and mists in 2.6.2.2.4.1 are based on LC_{50} data relating to one hour exposures, and where such information is available it shall be used. However, where only LC_{50} data relating to 4-hour exposures to dusts and mists are available, such figures can be multiplied by four and the product substituted in the above criteria, i.e. LC_{50} (4 hours) $\times$ 4 is considered the equivalent of LC_{50} (1 hour).

2.6.2.2.4.3 Liquids having toxic vapours shall be assigned to the following packing groups, where "*V*" is the saturated vapour concentration in mℓ/m^3 air at 20°C and standard atmospheric pressure:

Packing group I: if $V \geq 10\ LC_{50}$ and $LC_{50} \leq 1000$ mℓ/m^3.

Packing group II: if $V \geq LC_{50}$ and $LC_{50} \leq 3000$ mℓ/m^3, and do not meet the criteria for packing group I.

Packing group III: if $V \geq \frac{1}{5}\ LC_{50}$ and $LC_{50} \leq 5000$ mℓ/m^3, and do not meet the criteria for packing groups I or II.

Note: Tear gas substances shall be included in packing group II even if their toxicity data correspond to packing group III values.

2.6.2.2.4.4 In figure 2-3 the criteria according to 2.6.2.2.4.3 are expressed in graphical form, as an aid to easy classification. Because of approximations inherent in the use of graphs, substances falling on or near packing group borderlines shall be checked using numerical criteria.

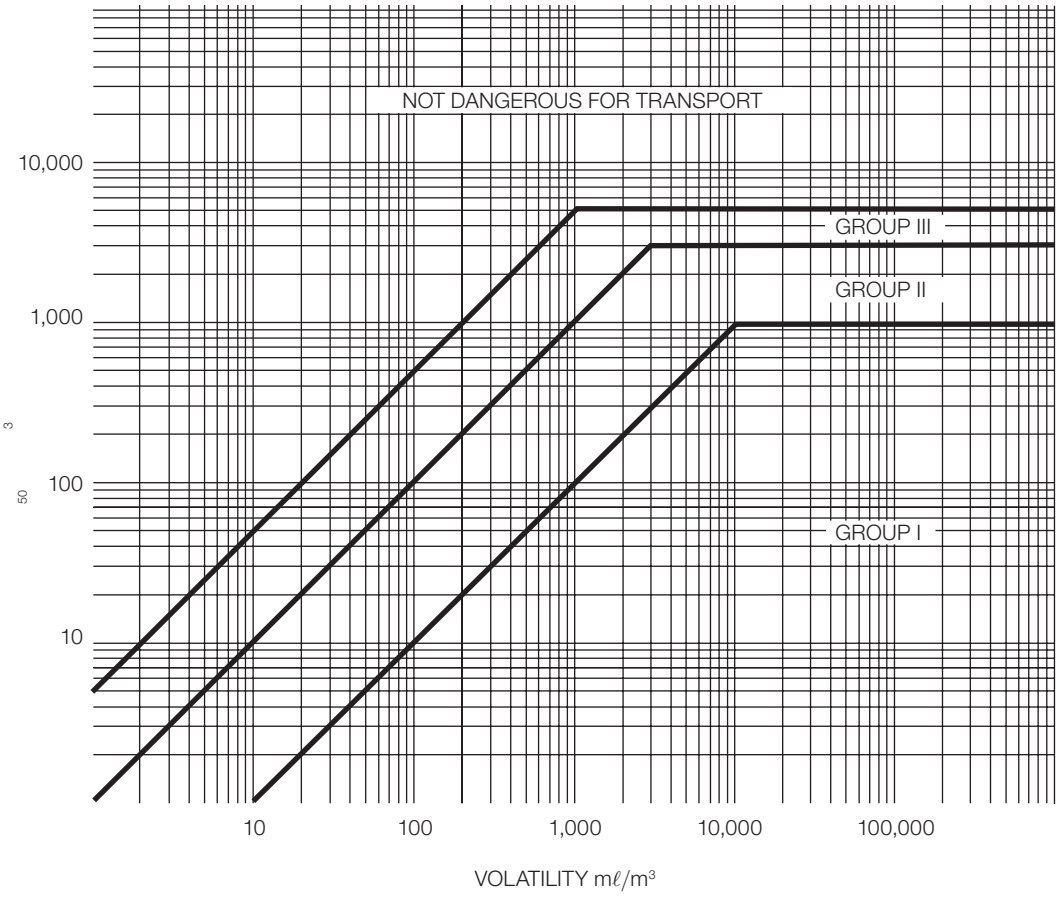


Figure 2-3 – *Inhalation toxicity: packing group borderlines*

2.6.2.2.4.5 The criteria for inhalation toxicity of vapours in 2.6.2.2.4.3 are based on LC_{50} data relating to one hour exposures, and where such information is available it shall be used. However, where only LC_{50} data relating to 4-hour exposures 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 hours) $\times$ 2 is considered the equivalent of LC_{50} (1 hour).

2.6.2.2.4.6 Mixtures of liquids that are toxic by inhalation shall be assigned to packing groups according to 2.6.2.2.4.7 or 2.6.2.2.4.8.

2.6.2.2.4.7 If LC_{50} data are available for each of the toxic substances comprising a mixture, the packing group may be determined as follows:

.1 Estimate the LC_{50} of the mixture using the formula:

$$\mathbf{LC_{50}\ (mixture)} = \frac{\mathbf{1}}{\sum_{i=1}^{n}\left(\frac{f_i}{\mathbf{LC_{50}}_i}\right)}$$

where: f_i = mole fraction of the i^{th} component substance of the mixture

LC_{50i} = mean lethal concentration of the i^{th} component substance in mℓ/m³.

.2 Estimate the volatility of each component substance comprising the mixture using the formula:

$$\mathbf{V}_i = \left(\frac{\mathbf{P}_i \times \mathbf{10^6}}{\mathbf{101.3}}\right) \mathbf{m\ell/m^3}$$

where: P_i = the partial pressure of the i^{th} component substance in kPa at 20°C and one atmosphere pressure.

.3 Calculate the ratio of the volatility to the LC_{50} using the formula:

$$\mathbf{R} = \sum_{i=1}^{n}\left(\frac{\mathbf{V}_i}{\mathbf{LC_{50}}_i}\right)$$

.4 Using the calculated values of LC_{50} (mixture) and *R*, the packing group for the mixture is determined:

Packing group I: $R \geq 10$ and LC_{50} (mixture) ≤ 1000 mℓ/m^3.

Packing group II: $R \geq 1$ and LC_{50} (mixture) ≤ 3000 mℓ/m^3 and not meeting criteria for packing group I.

Packing group III: $R \geq \frac{1}{5}$ and LC_{50} (mixture) ≤ 5000 mℓ/m^3 and not meeting criteria for packing groups I or II.

2.6.2.2.4.8 In the absence of LC_{50} data on the toxic constituent substances, the mixture may be assigned a packing group based on the following simplified threshold toxicity tests. When these threshold tests are used, the most restrictive packing group shall be determined and used for transporting the mixture.

.1 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/m^3 vaporized mixture in air. Ten albino rats (five male and five female) are exposed to the test atmosphere for one 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 LC_{50} equal to or less than 1000 mℓ/m^3.
- A sample of the vapour in equilibrium with the liquid mixture at 20°C is diluted with 9 equal volumes of air to form a test atmosphere. Ten albino rats (five male and five female) are exposed to the test atmosphere for one 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 LC_{50}.

.2 A mixture is assigned to packing group II only if it meets both of the following criteria, and the mixture 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/m^3 vaporized mixture in air. Ten albino rats (five male and five female) are exposed to the test atmosphere for one 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 LC_{50} equal to or less than 3000 mℓ/m^3.
- A sample of the vapour in equilibrium with the liquid mixture at 20°C is used to form a test atmosphere. Ten albino rats (five male and five female) are exposed to the test atmosphere for one 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 LC_{50}.

.3 A mixture is assigned to packing group III only if it meets both of the following criteria, and the mixture 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/m^3 vaporized mixture in air. Ten albino rats (five male and five female) are exposed to the test atmosphere for one 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 LC_{50} equal to or less than 5000 mℓ/m^3.
- The vapour pressure of the liquid mixture is measured and if the vapour concentration is equal to or greater than 1000 mℓ/m^3, the mixture is presumed to have a volatility equal to or greater than $\frac{1}{5}$ the mixture LC_{50}.

2.6.2.3 Methods for determining oral and dermal toxicity of mixtures

2.6.2.3.1 When classifying and assigning the appropriate packing group to mixtures in class 6.1, in accordance with the oral and dermal toxicity criteria in 2.6.2.2, it is necessary to determine the acute LD_{50} of the mixture.

2.6.2.3.2 If a mixture contains only one active substance, and the LD_{50} of that constituent is known, in the absence of reliable acute oral and dermal toxicity data on the actual mixture to be transported, the oral or dermal LD_{50} may be obtained by the following method:

$$\textbf{LD}_{50}\textbf{ value of preparation} = \frac{\textbf{LD}_{50}\textbf{ value of active substance} \times \textbf{100}}{\textbf{percentage of active substance by mass}}$$

2.6.2.3.3 If a mixture contains more than one active constituent, there are three possible approaches that may be used to determine the oral or dermal LD_{50} of the mixture. The preferred method is to obtain reliable acute oral and dermal toxicity data on the actual mixture to be transported. If reliable, accurate data are not available, then either of the following methods may be performed:

.1 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

.2 Apply the formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \cdots \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

where: C = the % concentration of constituent A, B . . . Z in the mixture;

T = the oral LD_{50} value of constituent A, B . . . Z;

T_M = the oral LD_{50} 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.

2.6.2.4 Classification of pesticides

2.6.2.4.1 All active pesticide substances and their preparations for which the LC_{50} and/or LD_{50} 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 2.6.2.2. Substances and preparations which are characterized by subsidiary risks shall be classified according to the precedence of hazard table in 2.0.3 with the assignment of appropriate packing groups.

2.6.2.4.2 If the oral or dermal LD_{50} value for a pesticide preparation is not known, but the LD_{50} value of its active substance(s) is known, the LD_{50} value for the preparation may be obtained by applying the procedures in 2.6.2.3.

Note: LD_{50} toxicity data for a number of common pesticides may be obtained from the most current edition of "The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification", available from the International Programme on Chemical Safety, World Health Organization (WHO), 1211 Geneva 27, Switzerland. While that publication may be used as a source of LD_{50} 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 provisions of this Code.

2.6.2.4.3 The Proper Shipping Name used in the transport of the pesticide shall be selected from those referenced on the basis of the active ingredient, of the physical state of the pesticide and any subsidiary risks which it may exhibit.

2.6.3 Class 6.2 – Infectious substances

2.6.3.1 Definitions

For the purposes of this Code:

2.6.3.1.1 *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.

2.6.3.1.2 *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 investigation purposes related thereto. They include, but are not limited to, finished or unfinished products such as vaccines.

2.6.3.1.3 *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 2.6.3.1.4.

2.6.3.1.4 *Patient specimens* are human or animal materials, collected directly from humans or animals, including, but not limited to, excreta, secreta, blood and its components, tissue and tissue fluid swabs, and body parts being transported for purposes such as research, diagnosis, investigational activities, disease treatment and prevention.

2.6.3.1.5 [Reserved]

2.6.3.1.6 *Medical or clinical wastes* are wastes derived from the medical treatment of animals or humans or from bio-research.

2.6.3.2 Classification of infectious substances

2.6.3.2.1 Infectious substances shall be classified in class 6.2 and assigned to UN 2814, UN 2900, UN 3291 or UN 3373, as appropriate.

2.6.3.2.2 Infectious substances are divided into the following categories:

2.6.3.2.2.1 *Category A:* An infectious substance which is transported 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 the protective packaging, resulting in physical contact with humans or animals.

(a) Infectious substances meeting these criteria which cause disease in humans or in both humans and animals shall be assigned to UN 2814. Infectious substances which cause disease only in animals shall be assigned to UN 2900.

(b) Assignment to UN 2814 or UN 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 human or animal source.

Note 1: The Proper Shipping Name for UN 2814 is INFECTIOUS SUBSTANCE, AFFECTING HUMANS. The Proper Shipping Name for UN 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 microorganism names written in italics are bacteria, mycoplasmas, rickettsiae or fungi.

Indicative examples of infectious substances included in category A in any form unless otherwise indicated (2.6.3.2.2.1 (a))

UN Number and Proper Shipping Name	Micro-organism
UN 2814 Infectious substance, affecting humans	*Bacillus anthracis* (cultures only) *Brucella abortus* (cultures only) *Brucella melitensis* (cultures only) *Brucella suis* (cultures only) *Burkholderia mallei – Pseudomonas mallei* – Glanders (cultures only) *Burkholderia pseudomallei – Pseudomonas pseudomallei* (cultures only) *Chlamydia psittaci* – avian strains (cultures only) *Clostridium botulinum* (cultures only) *Coccidioides immitis* (cultures only) *Coxiella burnetii* (cultures only) Crimean-Congo hemorrhagic fever virus Dengue virus (cultures only) Eastern equine encephalitis virus (cultures only) *Escherichia coli*, verotoxigenic (cultures only) Ebola virus Flexal virus *Francisella tularensis* (cultures only) Guanarito virus Hantaan virus Hantavirus causing hemorragic 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 *Mycobacterium tuberculosis* (cultures only) Nipah virus Omsk hemorrhagic fever virus Poliovirus (cultures only) Rabies virus (cultures only) *Rickettsia prowazekii* (cultures only) *Rickettsia rickettsii* (cultures only)

UN Number and Proper Shipping Name	Micro-organism
UN 2814 Infectious substance, affecting humans *(cont.)*	Rift Valley fever virus (cultures only) Russian spring–summer encephalitis virus (cultures only) Sabia virus *Shigella dysenteriae* type 1 (cultures only) Tick-borne encephalitis virus (cultures only) Variola virus Venezuelan equine encephalitis virus (cultures only) West Nile virus (cultures only) Yellow fever virus (cultures only) *Yersinia pestis* (cultures only)
UN 2900 Infectious substance, 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) *Mycoplasma mycoides* – 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)

2.6.3.2.2.2 *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 3373.

Note: The Proper Shipping Name for UN 3373 is "BIOLOGICAL SUBSTANCE, CATEGORY B".

2.6.3.2.3 *Exemptions*

2.6.3.2.3.1 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 this Code, unless they meet the criteria for inclusion in another class.

2.6.3.2.3.2 Substances containing microorganisms which are non-pathogenic to humans or animals are not subject to the provisions of this Code unless they meet the criteria for inclusion in another class.

2.6.3.2.3.3 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 the provisions of this Code unless they meet the criteria for inclusion in another class.

Note: Medical equipment which has been drained of free liquid is deemed to meet the requirements of this paragraph and is not subject to the provisions of this Code.

2.6.3.2.3.4 Environmental samples (including food and water samples) which are not considered to pose a significant risk of infection are not subject to the provisions of this Code unless they meet the criteria for inclusion in another class.

2.6.3.2.3.5 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 transplants are not subject to this Code.

2.6.3.2.3.6 Human or animal specimens for which there is minimal likelihood that pathogens are present are not subject to the provisions of this Code if the specimen is transported 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 should meet the following conditions:

(a) The packaging should consist 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 should be placed between the primary receptacle(s) and the secondary packaging so that, during transport, 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 should be either individually wrapped or separated to prevent contact between them.

Note: 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 transported under this paragraph include the 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 therapeutic drug monitoring; those conducted for insurance or employment purposes and are intended to determine the presence of drugs or alcohol; pregnancy test; 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.).

2.6.3.2.3.7 Except for:

(a) Medical waste (UN 3291);

(b) Medical devices or equipment contaminated with or containing infectious substances in Category A (UN 2814 or UN 2900); and

(c) Medical devices or equipment contaminated with or containing other dangerous goods that meet the definition of another hazard class,

medical devices or equipment potentially contaminated with or containing infectious substances which are being transported for disinfection, cleaning, sterilization, repair, or equipment evaluation are not subject to the provisions of this Code if packed in packagings designed and constructed in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents. Packagings shall be designed to meet the construction requirements listed in 6.1.4 or 6.6.5.

These packagings shall meet the general packing requirements of 4.1.1.1 and 4.1.1.2 and be capable of retaining the medical devices and equipment when dropped from a height of 1.2 m.

The packagings shall be marked “USED MEDICAL DEVICE” or “USED MEDICAL EQUIPMENT”. When using overpacks, or unit loads these shall be marked in the same way, except when the inscription remains visible.

2.6.3.3 Biological products

2.6.3.3.1 For the purposes of this Code, 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 transported 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 this Code.

(b) those which do not fall under (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 2814, UN 2900 or UN 3373, as appropriate.

Note: Some licensed biological products may present a biohazard only in certain parts of the world. Competent authorities may require that such biological products comply with local requirements for infectious substances or may impose other restrictions.

2.6.3.4 Genetically modified microorganisms and organisms

2.6.3.4.1 Genetically modified microorganisms not meeting the definition of infectious substance shall be classified in accordance with chapter 2.9.

2.6.3.5 Medical or clinical wastes

2.6.3.5.1 Medical or clinical wastes containing Category A infectious substances shall be assigned to UN 2814 or UN 2900, as appropriate. Medical or clinical wastes containing infectious substances in Category B shall be assigned to UN 3291.

2.6.3.5.2 Medical or clinical wastes which are reasonably believed to have a low probability of containing infectious substances shall be assigned to UN 3291. For the assignment, international, regional or national waste catalogues may be taken into account.

Note: The Proper Shipping Name for UN 3291 is CLINICAL WASTE, UNSPECIFIED, N.O.S. or (BIO) MEDICAL WASTE, N.O.S. or REGULATED MEDICAL WASTE, N.O.S.

2.6.3.5.3 Decontaminated medical or clinical wastes which previously contained infectious substances are not subject to the provisions of this Code unless they meet the criteria for inclusion in another class.

2.6.3.6 Infected animals

2.6.3.6.1 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 transported under terms and conditions approved by the competent authority.

2.6.3.6.2 Animal material affected by pathogens of Category A or 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.

Chapter 2.7

Class 7 – Radioactive material

Note: For class 7, the type of packaging may have a decisive effect on classification.

2.7.1 Definitions

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 2.7.2.2.1 to 2.7.2.2.6.

2.7.1.2 Contamination

Contamination means the presence of a radioactive substance on a surface in quantities in excess of 0.4 Bq/cm^2 for beta and gamma emitters and low-toxicity alpha emitters, or 0.04 Bq/cm^2 for all other alpha emitters.

Non-fixed contamination means contamination that can be removed from a surface during routine conditions of transport.

Fixed contamination means contamination other than non-fixed contamination.

2.7.1.3 Definitions of specific terms

A_1 and A_2

A_1 means the activity value of special form radioactive material which is listed in the table in 2.7.2.2.1 or derived in 2.7.2.2.2 and is used to determine the activity limits for the provisions of this Code.

A_2 means the activity value of radioactive material, other than special form radioactive material, which is listed in the table in 2.7.2.2.1 or derived in 2.7.2.2.2 and is used to determine the activity limits for the provisions of this Code.

Fissile nuclides means uranium-233, uranium-235, plutonium-239 and plutonium-241. *Fissile material* means a material containing any of the fissile nuclides. Excluded from the definition of fissile material are:

.1 Natural uranium or depleted uranium which is unirradiated; and

.2 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:

.1 An indispersible solid radioactive material; or

.2 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.

2.7.2 Classification

2.7.2.1 General provisions

2.7.2.1.1 Radioactive material shall be assigned to one of the UN Numbers specified in table 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 transport, and the nature or form of the contents of the package, or special arrangements governing the transport operation, in accordance with the provisions laid down in 2.7.2.2 to 2.7.2.5.

Table 2.7.2.1.1 – Assignment of UN Numbers

Excepted packages (1.5.1.5)	
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 (2.7.2.3.1)	
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 (2.7.2.3.2)	
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 (2.7.2.4.4)	
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) package (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) package (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 package (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 (2.7.2.5)	
UN 2919	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, non-fissile or fissile – excepted
UN 3331	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, FISSILE
Uranium hexafluoride (2.7.2.4.5)	
UN 2977	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE
UN 2978	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, non-fissile or fissile – excepted

2.7.2.2 Determination of activity level

2.7.2.2.1 The following basic values for individual radionuclides are given in table 2.7.2.2.1:

.1 A_1 and A_2 in TBq;

.2 Activity concentration for exempt material in Bq/g; and

.3 Activity limits for exempt consignments in Bq.

Table 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}
Au-194	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)
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}
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}

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
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}
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)				
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}

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
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)				
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}
Ir-190	7×10^{-1}	7×10^{-1}	1×10^{1}	1×10^{6}
Ir-192	1×10^{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}	2×10^{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}

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
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}
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)				
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}

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
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)				
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}
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)				

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
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}
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}
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}

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
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)*
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) *(a) (d) (e) (f)*	Unlimited	Unlimited	1×10^{1} *(b)*	1×10^{4} *(b)*
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}

Radionuclide (atomic number)	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
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}
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 $UO_2(NO_3)_2$ in both normal and accident conditions of transport.

(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 transport.

(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.

2.7.2.2.2 For individual radionuclides which are not listed in table 2.7.2.2.1, the determination of the basic radionuclide values referred to in 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 transport are taken into consideration. Alternatively, the radionuclide values in table 2.7.2.2.2 may be used without obtaining competent authority approval.

Table 2.7.2.2.2 – Basic radionuclide values for unknown radionuclides or mixtures

Radioactive contents	A_1 (TBq)	A_2 (TBq)	Activity concentration for exempt material (Bq/g)	Activity limit for exempt consignments (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}

2.7.2.2.3 In the calculations of A_1 and A_2 for a radionuclide not in table 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.

2.7.2.2.4 For mixtures of radionuclides, the determination of the basic radionuclide values referred to in 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 A_1 or A_2, 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 A_1 or A_2, or the activity concentration for exempt material or the activity limit for an exempt consignment in the case of a mixture.

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 formulae in 2.7.2.2.4 and 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.

2.7.2.2.6 For individual radionuclides or for mixtures of radionuclides for which relevant data are not available, the values shown in table 2.7.2.2.2 shall be used.

2.7.2.3 Determination of other material characteristics

2.7.2.3.1 *Low specific activity (LSA) material*

2.7.2.3.1.1 [Reserved]

2.7.2.3.1.2 LSA material shall be in one of three groups:

.1 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, that are unirradiated and in solid or liquid form;

(iii) radioactive material for which the A_2 value is unlimited, excluding fissile material not excepted under 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 2.7.2.2.1 to 2.7.2.2.6, excluding fissile material not excepted under 2.7.2.3.5;

.2 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;

.3 LSA-III – Solids (e.g., consolidated wastes, activated materials), excluding powders, meeting the requirements of 2.7.2.3.1.3, 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 $0.1A_2$; and

(iii) the estimated average specific activity of the solid, excluding any shielding material, does not exceed $2 \times 10^{-3}A_2$/g.

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 2.7.2.3.1.4, the activity in the water would not exceed $0.1A_2$.

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.

2.7.2.3.1.5 Demonstration of compliance with the performance standards in 2.7.2.3.1.4 shall be in accordance with 6.4.12.1 and 6.4.12.2.

2.7.2.3.2 ***Surface contaminated object (SCO)***

SCO is classified in one of two groups:

.1 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;

(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 4×10^4 Bq/cm^2 for beta and gamma emitters and low-toxicity alpha emitters, or 4×10^3 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/cm^2 for beta and gamma emitters and low-toxicity alpha emitters, or 4×10^3 Bq/cm^2 for all other alpha emitters;

.2 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 2.7.2.3.2.1 above and 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 400 Bq/cm^2 for beta and gamma emitters and low-toxicity alpha emitters, or 40 Bq/cm^2 for all other alpha emitters;

(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 8×10^5 Bq/cm^2 for beta and gamma emitters and low-toxicity alpha emitters, or 8×10^4 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 8×10^5 Bq/cm^2 for beta and gamma emitters and low-toxicity alpha emitters, or 8×10^4 Bq/cm^2 for all other alpha emitters.

2.7.2.3.3 ***Special form radioactive material***

2.7.2.3.3.1 .1 Special form radioactive material shall have at least one dimension not less than 5 mm.

.2 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.

.3 The design for special form radioactive material requires unilateral approval.

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 2.7.2.3.3.4 to 2.7.2.3.3.8, it shall meet the following requirements:

.1 It would not break or shatter under the impact, percussion and bending tests 2.7.2.3.3.5.1, 2.7.2.3.3.5.2, 2.7.2.3.3.5.3, and 2.7.2.3.3.6.1 as applicable;

.2 It would not melt or disperse in the applicable heat test 2.7.2.3.3.5.4 or 2.7.2.3.3.6.2 as applicable; and

.3 The activity in the water from the leaching tests specified in 2.7.2.3.3.7 and 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.

2.7.2.3.3.3 Demonstration of compliance with the performance standards in 2.7.2.3.3.2 shall be in accordance with 6.4.12.1 and 6.4.12.2.

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 2.7.2.3.3.5 or alternative tests as authorized in 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 2.7.2.3.3.7 for indispersible solid material or 2.7.2.3.3.8 for encapsulated material.

2.7.2.3.3.5 The relevant test methods are:

.1 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;

.2 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 $\pm$ 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;

.3 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 $\pm$ 0.3) mm;

.4 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.

2.7.2.3.3.6 Specimens that comprise or simulate radioactive material enclosed in a sealed capsule may be excepted from:

.1 The tests prescribed in 2.7.2.3.3.5.1 and 2.7.2.3.3.5.2 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

.2 The test prescribed in 2.7.2.3.3.5.4 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".

2.7.2.3.3.7 For specimens which comprise or simulate indispersible solid material, a leaching assessment shall be performed as follows:

.1 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;

.2 The water with specimen shall then be heated to a temperature of (50 $\pm$ 5)°C and maintained at this temperature for 4 hours;

.3 The activity of the water shall then be determined;

.4 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%;

.5 The specimen shall then be immersed in water of the same specification as in 2.7.2.3.3.7.1 above and the water with the specimen heated to (50 ± 5)°C and maintained at this temperature for 4 hours;

.6 The activity of the water shall then be determined.

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:

.1 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.

.2 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.

2.7.2.3.4 *Low dispersible material*

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, taking into account the provisions of 6.4.8.14, shall meet the following provisions:

.1 The radiation level at 3 m from the unshielded radioactive material does not exceed 10 mSv/h;

.2 If subjected to the tests specified in 6.4.20.3 and 6.4.20.4, the airborne release in gaseous and particulate forms of up to 100 μm aerodynamic equivalent diameter would not exceed $100A_2$. A separate specimen may be used for each test; and

.3 If subjected to the test specified in 2.7.2.3.1.4, the activity in the water would not exceed $100A_2$. In the application of this test, the damaging effects of the tests specified in 2.7.2.3.4.1.2 above shall be taken into account.

2.7.2.3.4.2 Low dispersible 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 and the impact test specified in 6.4.20.4. 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 2.7.2.3.1.4. After each test it shall be determined if the applicable provisions of 2.7.2.3.4.1 have been met.

2.7.2.3.4.3 Demonstration of compliance with the performance standards in 2.7.2.3.4.1 and 2.7.2.3.4.2 shall be in accordance with 6.4.12.1 and 6.4.12.2.

2.7.2.3.5 *Fissile material*

Packages containing fissile material shall be classified under the relevant entry of table 2.7.2.1.1, the description of which includes the words "FISSILE" or "fissile-excepted". Classification as "fissile-excepted" is allowed only if one of the conditions .1 to .4 of this paragraph is met. Only one type of exception is allowed per consignment (see also 6.4.7.2).

.1 A mass limit per consignment, provided that the smallest external dimension of each package is not less than 10 cm, 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 2.7.2.3.5, provided that either:

(i) each individual package contains not more than 15 g of fissile nuclides; for unpackaged material, this quantity limitation shall apply to the consignment being carried in or on the 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 nuclides in any 10 litre volume of material.

Beryllium shall not be present in quantities exceeding 1% of the applicable consignment mass limits provided in table 2.7.2.3.5 except where the concentration of beryllium in the material does not exceed 1 gram beryllium in any 1000 grams.

Deuterium shall also not be present in quantities exceeding 1% of the applicable consignment mass limits provided in table 2.7.2.3.5 except where deuterium occurs up to natural concentration in hydrogen.

.2 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 nuclides are 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;

.3 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;

.4 Plutonium containing not more than 20% of fissile nuclides by mass up to a maximum of 1 kg of plutonium per consignment. Shipments under this exception shall be under exclusive use.

Table 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

2.7.2.4 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.

2.7.2.4.1 *Classification as excepted package*

2.7.2.4.1.1 Packages may be classified as excepted packages if:

.1 They are empty packagings having contained radioactive material;

.2 They contain instruments or articles in limited quantities as specified in table 2.7.2.4.1.2;

.3 They contain articles manufactured of natural uranium, depleted uranium or natural thorium; or

.4 They contain radioactive material in limited quantities as specified in table 2.7.2.4.1.2.

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 μSv/h.

Table 2.7.2.4.1.2 – Activity limits for excepted packages

Physical state of contents	Instruments or article		Material 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 2.7.2.2.4 to 2.7.2.2.6.

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 2911, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – INSTRUMENTS or ARTICLES only if:

.1 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

.2 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 1.5.1.4.4 or do not individually exceed the activity limit for an exempt consignment in table 2.7.2.2.1 (column 5), provided such products are transported 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

.3 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

.4 the limits specified in columns 2 and 3 of table 2.7.2.4.1.2 are met for each individual item and each package, respectively.

2.7.2.4.1.4 Radioactive material in forms other than as specified in 2.7.2.4.1.3 and with an activity not exceeding the limits specified in column 4 of Table 2.7.2.4.1.2, may be classified under UN 2910, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – LIMITED QUANTITY OF MATERIAL provided that:

.1 the package retains its radioactive contents under routine conditions of transport; and

.2 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.

2.7.2.4.1.5 An empty packaging which had previously contained radioactive material may be classified under UN 2908, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – EMPTY PACKAGING, only if:

.1 it is in a well-maintained condition and securely closed;

.2 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;

.3 the level of internal non-fixed contamination, when averaged over any 300 cm^2, does not exceed:

(i) 400 Bq/cm^2 for beta and gamma emitters and low-toxicity alpha emitters; and

(ii) 40 Bq/cm^2 for all other alpha emitters; and

.4 any labels which may have been displayed on it in conformity with 5.2.2.1.12.1 are no longer visible.

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 2909, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – ARTICLES MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or NATURAL THORIUM, only if the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

2.7.2.4.2 ***Classification as Low specific activity (LSA) material***

Radioactive material may only be classified as LSA material if the definition of LSA in 2.7.1.3 and the conditions of 2.7.2.3.1, 4.1.9.2 and 7.1.4.5.1 are met.

2.7.2.4.3 ***Classification as Surface contaminated object (SCO)***

Radioactive material may be classified as SCO if the definition of SCO in 2.7.1.3 and the conditions of 2.7.2.3.2, 4.1.9.2 and 7.1.4.5.1 are met.

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:

.1 For special form radioactive material – A_1; or

.2 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.

2.7.2.4.5 *Classification of uranium hexafluoride*

Uranium hexafluoride shall only be assigned to UN No. 2977, RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE, or 2978, RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, non-fissile or fissile – excepted.

2.7.2.4.5.1 Packages containing uranium hexafluoride shall not contain:

.1 a mass of uranium hexafluoride different from that authorized for the package design;

.2 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

.3 uranium hexafluoride other than in solid form or at an internal pressure above atmospheric pressure when presented for transport.

2.7.2.4.6 *Classification as Type B(U), Type B(M) or Type C packages*

2.7.2.4.6.1 Packages not otherwise classified in 2.7.2.4 (2.7.2.4.1 to 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.

2.7.2.4.6.2 A package may only be classified as a Type B(U) if it does not contain:

.1 activities greater than those authorized for the package design;

.2 radionuclides different from those authorized for the package design; or

.3 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.

2.7.2.4.6.3 A package may only be classified as a Type B(M) if it does not contain:

.1 activities greater than those authorized for the package design;

.2 radionuclides different from those authorized for the package design; or

.3 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.

2.7.2.4.6.4 A package may only be classified as a Type C if it does not contain:

.1 activities greater than those authorized for the package design;

.2 radionuclides different from those authorized for the package design; or

.3 contents in a form, or physical or chemical state, different from those authorized for the package design,

as specified in the certificate of approval.

2.7.2.5 Special arrangements

Radioactive material shall be classified as transported under special arrangement when it is intended to be transported in accordance with 1.5.4.

Chapter 2.8

Class 8 – Corrosive substances

2.8.1 Definition and properties

2.8.1.1 Definition

Class 8 substances (corrosive substances) means substances which, by chemical action, will cause severe damage when in contact with living tissue or, in the case of leakage, will materially damage, or even destroy, other goods or the means of transport.

2.8.1.2 Properties

2.8.1.2.1 In cases where particularly severe personal damage is to be expected, a note to that effect is made in the Dangerous Goods List in chapter 3.2 in the wording "causes (severe) burns to skin, eyes and mucous membranes".

2.8.1.2.2 Many substances are sufficiently volatile to evolve vapour irritating to the nose and eyes. If so, this fact is mentioned in the Dangerous Goods List in chapter 3.2 in the wording "vapour irritates mucous membranes".

2.8.1.2.3 A few substances may produce toxic gases when decomposed by very high temperatures. In these cases the statement "when involved in a fire, evolves toxic gases" appears in the Dangerous Goods List in chapter 3.2.

2.8.1.2.4 In addition to direct destructive action in contact with skin or mucous membranes, some substances in this class are toxic or harmful. Poisoning may result if they are swallowed, or if their vapour is inhaled; some of them even may penetrate the skin. Where appropriate, a statement is made to that effect in the Dangerous Goods List in chapter 3.2.

2.8.1.2.5 All substances in this class have a more or less destructive effect on materials such as metals and textiles.

2.8.1.2.5.1 In the Dangerous Goods List, the term "corrosive to most metals" means that any metal likely to be present in a ship, or in its cargo, may be attacked by the substance or its vapour.

2.8.1.2.5.2 The term "corrosive to aluminium, zinc, and tin" implies that iron or steel is not damaged in contact with the substance.

2.8.1.2.5.3 A few substances in this class can corrode glass, earthenware and other siliceous materials. Where appropriate, this is stated in the Dangerous Goods List in chapter 3.2.

2.8.1.2.6 Many substances in this class only become corrosive after having reacted with water, or with moisture in the air. This fact is indicated in the Dangerous Goods List in chapter 3.2 by the words "in the presence of moisture…". The reaction of water with many substances is accompanied by the liberation of irritating and corrosive gases. Such gases usually become visible as fumes in the air.

2.8.1.2.7 A few substances in this class generate heat in reaction with water or organic materials, including wood, paper, fibres, some cushioning materials and certain fats and oils. Where appropriate, this is indicated in the Dangerous Goods List in chapter 3.2.

2.8.1.2.8 A substance which is designated as "stabilized" shall not be transported in the unstabilized state.

2.8.2 Assignment of packing groups

2.8.2.1 Substances and preparations of class 8 are divided among the three packing groups according to their degree of hazard in transport as follows:

Packing group I: Very dangerous substances and preparations;

Packing group II: Substances and preparations presenting medium danger;

Packing group III: Substances and preparations presenting minor danger.

The packing group to which a substance has been assigned is given in the Dangerous Goods List in chapter 3.2.

2.8.2.2 Allocation of substances listed in the Dangerous Goods List in chapter 3.2 to the packing groups in class 8 has been on the basis of experience, taking into account such additional factors as inhalation risk (see 2.8.2.3) and reactivity with water (including the formation of dangerous decomposition products). New substances, including mixtures, can be assigned to packing groups on the basis of the length of time of contact necessary to produce full thickness destruction of human skin in accordance with the criteria in 2.8.2.5. Liquids, and solids which may become liquid during transport, which are judged not to cause full thickness destruction of human skin shall still be considered for their potential to cause corrosion in certain metal surfaces in accordance with the criteria in 2.8.2.5.3.2.

2.8.2.3 A substance or preparation meeting the criteria of class 8 and having an inhalation toxicity of dusts and mists (LC_{50}) 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 (see Note under 2.6.2.2.4.1).

2.8.2.4 In assigning the packing group to a substance in accordance with 2.8.2.2, 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 Test Guideline 404[*] or 435[†]. A substance which is determined not to be corrosive in accordance with OECD Test Guideline 430[‡] or 431[§] may be considered not to be corrosive to skin for the purposes of this Code without further testing.

2.8.2.5 Packing groups are assigned to corrosive substances in accordance with the following criteria:

.1 Packing group I is assigned to substances that cause full thickness destruction of intact skin tissue within an observation period of up to 60 minutes starting after an exposure time of 3 minutes or less.

.2 Packing group II is assigned to substances that cause full thickness destruction of intact skin tissue within an observation period of up to 14 days starting after an exposure time of more than 3 but not more than 60 minutes.

.3 Packing group III is assigned to substances that:

.1 cause full thickness destruction of intact skin tissue within an observation period of up to 14 days starting after an exposure time of more than 60 minutes but not more than 4 hours; or

.2 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 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 3574:1999, 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 United Nations *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.

Table 2.8.2.5 – Table summarizing the criteria in 2.8.2.5

Packing Group	Exposure Time	Observation Period	Effect
I	$\leq$ 3 min	$\leq$ 60 min	Full thickness destruction of intact skin
II	$>$ 3 min $\leq$ 1 h	$\leq$ 14 d	Full thickness destruction of intact skin
III	$>$ 1 h $\leq$ 4 h	$\leq$ 14 d	Full thickness destruction of intact skin
III	–	–	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 materials

[*] OECD Guideline for the testing of chemicals No. 404 "Acute Dermal Irritation/Corrosion" 2002.

[†] OECD Guideline for the testing of chemicals No. 435 "*In Vitro* Membrane Barrier Test Method for Skin Corrosion" 2006.

[‡] OECD Guideline for the testing of chemicals No. 430 "*In Vitro* Skin Corrosion: Transcutaneous Electrical Resistance Test (TER)" 2004.

[§] OECD Guideline for the testing of chemicals No. 431 "*In Vitro* Skin Corrosion: Human Skin Model Test" 2004.

Chapter 2.9

Miscellaneous dangerous substances and articles (Class 9) and environmentally hazardous substances

Note 1: For the purposes of this Code, the environmentally hazardous substances (aquatic environment) criteria contained in this chapter apply to the classification of marine pollutants (see 2.10).

Note 2: Although the environmentally hazardous substances (aquatic environment) criteria apply to all hazard classes (see 2.10.2.3 and 2.10.2.5), the criteria have been included in this chapter.

2.9.1 Definitions

2.9.1.1 *Class 9 substances and articles (miscellaneous dangerous substances and articles)* are substances and articles which, during transport, present a danger not covered by other classes.

2.9.2 Assignment to class 9

2.9.2.1 Class 9 includes, *inter alia*:

.1 substances and articles not covered by other classes which experience has shown, or may show, to be of such a dangerous character that the provisions of part A of chapter VII of SOLAS 1974, as amended, shall apply.

.2 substances not subject to the provisions of part A in chapter VII of the aforementioned Convention, but to which the provisions of Annex III of MARPOL 73/78, as amended, apply.

2.9.2.2 The substances and articles of class 9 are subdivided as follows:

Substances which, on inhalation as fine dust, may endanger health

2212 BLUE ASBESTOS (crocidolite) or

2212 BROWN ASBESTOS (amosite, mysorite)

2590 WHITE ASBESTOS (chrysotile, actinolite, anthophyllite, tremolite)

Substances evolving flammable vapour

2211 POLYMERIC BEADS, EXPANDABLE, evolving flammable vapour

3314 PLASTICS MOULDING COMPOUND in dough, sheet or extruded rope form evolving flammable vapour

Lithium batteries

3090 LITHIUM METAL BATTERIES (including lithium alloy batteries)

3091 LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT (including lithium alloy batteries) or

3091 LITHIUM METAL 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)

Note: See 2.9.4.

Electric double layer capacitors

3499 CAPACITOR, electric double layer (with an energy storage capacity greater than 0.3 Wh)

Life-saving appliances

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

Substances and articles which, in the event of fire, may form dioxins

This group of substances includes:

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

Examples of articles are transformers, condensers and apparatus containing those substances.

Substances transported or offered for transport at elevated temperatures

3257 ELEVATED TEMPERATURE LIQUID, N.O.S., at or above 100°C and below its flashpoint (including molten metal, molten salts, etc.)

3258 ELEVATED TEMPERATURE SOLID, N.O.S., at or above 240°C

Environmentally hazardous substances

3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

These entries are used for substances and mixtures which are dangerous to the aquatic environment that do not meet the classification criteria of any other class or another substance within class 9. These entries may also be used for wastes not otherwise subject to the provisions of this Code but which are covered under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and for substances designated to be environmentally hazardous substances by the competent authority of the country of origin, transit or destination which do not meet the criteria for an environmentally hazardous substance according to the provisions of this Code or for any other hazard class. The criteria for substances which are hazardous to the aquatic environment are given in section 2.9.3.

Genetically modified microorganisms (GMMOs) and genetically modified organisms (GMOs)

3245 GENETICALLY MODIFIED MICROORGANISMS or

3245 GENETICALLY MODIFIED ORGANISMS

GMMOs and GMOs which do not meet the definition of toxic substances (see 2.6.2) or infectious substances (see 2.6.3) shall be assigned to UN 3245.

GMMOs or GMOs are not subject to the provisions of this Code when authorized for use by the competent authorities of the countries of origin, transit and destination.

Genetically modified live animals shall be transported under terms and conditions of the competent authorities of the countries of origin and destination.

Other substances or articles presenting a danger during transport, but not meeting the definitions of another class:

1841 ACETALDEHYDE AMMONIA

1845 CARBON DIOXIDE, SOLID (DRY ICE)

1931 ZINC DITHIONITE (ZINC HYDROSULPHITE)

1941 DIBROMODIFLUOROMETHANE

1990 BENZALDEHYDE

2071 AMMONIUM NITRATE BASED FERTILIZER

2216 FISH MEAL (FISH SCRAP), STABILIZED

2807 MAGNETIZED MATERIAL*

2969 CASTOR BEANS or

2969 CASTOR MEAL or

2969 CASTOR POMACE or

2969 CASTOR FLAKE

3166 ENGINE, INTERNAL COMBUSTION or

3166 VEHICLE, FLAMMABLE GAS POWERED or

3166 VEHICLE, FLAMMABLE LIQUID POWERED or

3166 ENGINE, FUEL CELL, FLAMMABLE GAS POWERED or

3166 ENGINE, FUEL CELL, FLAMMABLE LIQUID POWERED or

3166 VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED or

3166 VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED

3171 BATTERY-POWERED VEHICLE or

3171 BATTERY-POWERED EQUIPMENT

3316 CHEMICAL KIT or

3316 FIRST AID KIT

3334 AVIATION REGULATED LIQUID, N.O.S.*

3335 AVIATION REGULATED SOLID, N.O.S.*

3359 FUMIGATED CARGO TRANSPORT UNIT

3363 DANGEROUS GOODS IN MACHINERY or

3363 DANGEROUS GOODS IN APPARATUS

3496 BATTERIES, NICKEL-METAL HYDRIDE

2.9.3 Environmentally hazardous substances (aquatic environment)

2.9.3.1 General definitions

2.9.3.1.1 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 section,

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.

* Not subject to the provisions of this Code but may be subject to provisions governing the transport of dangerous goods by other modes (see also special provision 960).

2.9.3.1.2 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[*]. 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.

2.9.3.1.3 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[†].

2.9.3.1.4 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;
ECx	the concentration associated with x% response;
EC_{50}	the effective concentration of substance that causes 50% of the maximum response;
ErC_{50}	EC_{50} in terms of reduction of growth;
K_{ow}	octanol/water partition coefficient;
LC_{50} (50% lethal concentration)	the concentration of a substance in water which causes the death of 50% (one half) in a group of test animals;
$L(E)C_{50}$	LC_{50} or EC_{50};
NOEC (No Observed Effect Concentration)	the test concentration immediately below the lowest tested concentration with statistically significant adverse effect. The NOEC has no statistically significant adverse effect compared to the control;
OECD Test Guidelines	Test guidelines published by the Organization for Economic Co-operation and Development (OECD).

2.9.3.2 Definitions and data requirements

2.9.3.2.1 The basic elements for classification of environmentally hazardous substances (aquatic environment) are:

(a) acute aquatic toxicity;

(b) chronic aquatic toxicity

(c) potential for or actual bioaccumulation; and

(d) degradation (biotic or abiotic) for organic chemicals;

2.9.3.2.2 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 shall be based on the best available data.

2.9.3.2.3 *Acute aquatic toxicity* means the intrinsic property of a substance to be injurious to an organism in a short-term aquatic exposure to that substance.

Acute (short-term) hazard, for classification purposes, means the hazard of a chemical caused by its acute toxicity to an organism during short-term aquatic exposure to that chemical.

Acute aquatic toxicity shall normally be determined using a fish 96 hour LC50 (OECD Test Guideline 203 or equivalent), a crustacea species 48 hour EC_{50} (OECD Test Guideline 202 or equivalent) and/or an algal species 72 or 96 hour EC_{50} (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.

2.9.3.2.4 Chronic aquatic toxicity means the intrinsic property of a substance to cause adverse effects to aquatic organisms during aquatic exposures which are determined in relation to the life cycle of the organism.

[*] 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.

[†] This can be found in annex 10 of the GHS.

Long-term hazard, for classification purposes, means the hazard of a chemical caused by its chronic toxicity following long-term exposure in the aquatic environment.

Chronic toxicity data are less available than acute data and the range of testing procedures less standardized. Data generated according to the OECD Test Guidelines 210 (Fish Early Life Stage) or 211 (Daphnia Reproduction) and 201 (Algal Growth Inhibition) may be accepted. Other validated and internationally accepted tests may also be used. The NOECs or other equivalent EC_x shall be used.

2.9.3.2.5 *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 according to OECD Test Guideline 107 or 117. While this represents a potential to bioaccumulate, an experimentally determined Bioconcentration Factor (BCF) provides a better measure and shall be used in preference when available. A BCF shall be determined according to OECD Test Guideline 305.

2.9.3.2.6 *Degradation* means the decomposition of organic molecules to smaller molecules and eventually to carbon dioxide, water and salts.

Environmental degradation may be biotic or abiotic (e.g., hydrolysis) and the criteria used reflect this fact. Ready biodegradation is most easily defined using the biodegradability tests (A F) of OECD Test Guideline 301. A pass level in these tests may 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 BOD(5 days)/COD ratio $\geq$ 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[*].

Substances are 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%;

  (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, unless the substance is identified as a complex, multi-component substance with structurally similar constituents. In this case, and where there is sufficient justification, the 10-day window condition may be waived and the pass level applied at 28 days[†];

(b) In those cases where only BOD and COD data are available, when the ratio of BOD5/COD is $\geq$ 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.

2.9.3.3 Substance classification categories and criteria

2.9.3.3.1 Substances shall be classified as "environmentally hazardous substances (aquatic environment)", if they satisfy the criteria for Acute 1, Chronic 1 or Chronic 2, according to Table 2.9.1. These criteria describe in detail the classification categories. They are diagrammatically summarized in Table 2.9.2.

Table 2.9.1 – Categories for substances hazardous to the aquatic environment (see Note 1)

(a) Acute (short-term) aquatic hazard

Category: Acute 1 (see Note 2)	
96 hr LC_{50} (for fish)	$\leq$ 1 mg/ℓ and/or
48 hr EC_{50} (for crustacea)	$\leq$ 1 mg/ℓ and/or
72 or 96 hr ErC_{50} (for algae or other aquatic plants)	$\leq$ 1 mg/ℓ (see Note 3)

[*] Special guidance on data interpretation is provided in chapter 4.1 and annex 9 of the GHS.

[†] See chapter 4.1 and annex 9, paragraph A9.4.2.2.3 of the GHS.

(b) Long-term aquatic hazard (see also Figure 2.9.1)

(i) Non-rapidly degradable substances (see Note 4) for which there are adequate chronic toxicity data available

Category Chronic 1: (see Note 2)	
Chronic NOEC or EC_x (for fish)	$\leq$ 0.1 mg/ℓ and/or
Chronic NOEC or EC_x (for crustacea)	$\leq$ 0.1 mg/ℓ and/or
Chronic NOEC or EC_x (for algae or other aquatic plants)	$\leq$ 0.1 mg/ℓ

Category Chronic 2:	
Chronic NOEC or EC_x (for fish)	$\leq$ 1 mg/ℓ and/or
Chronic NOEC or EC_x (for crustacea)	$\leq$ 1 mg/ℓ and/or
Chronic NOEC or EC_x (for algae or other aquatic plants)	$\leq$ 1 mg/ℓ

(ii) Rapidly degradable substances for which there are adequate chronic toxicity data available

Category Chronic 1: (see Note 2)	
Chronic NOEC or EC_x (for fish)	$\leq$ 0.01 mg/ℓ and/or
Chronic NOEC or EC_x (for crustacea)	$\leq$ 0.01 mg/ℓ and/or
Chronic NOEC or EC_x (for algae or other aquatic plants)	$\leq$ 0.01 mg/ℓ

Category Chronic 2:	
Chronic NOEC or EC_x (for fish)	$\leq$ 0.1 mg/ℓ and/or
Chronic NOEC or EC_x (for crustacea)	$\leq$ 0.1 mg/ℓ and/or
Chronic NOEC or EC_x (for algae or other aquatic plants)	$\leq$ 0.1 mg/ℓ

(iii) Substances for which adequate chronic toxicity data are not available

Category Chronic 1: (see Note 2)	
96 hr LC_{50} (for fish)	$\leq$ 1 mg/ℓ and/or
48 hr EC_{50} (for crustacea)	$\leq$ 1 mg/ℓ and/or
72 or 96 hr ErC_{50} (for algae or other aquatic plants)	$\leq$ 1 mg/ℓ (see Note 3)
and the substance is not rapidly degradable and/or the experimentally determined BCF is $\geq$ 500 (or, if absent the log $K_{ow} \geq 4$) (see Notes 4 and 5)	

Category Chronic 2:	
96 hr LC_{50} (for fish)	$>$ 1 but $\leq$ 10 mg/ℓ and/or
48 hr EC_{50} (for crustacea)	$>$ 1 but $\leq$ 10 mg/ℓ and/or
72 or 96 hr ErC_{50} (for algae or other aquatic plants)	$>$ 1 but $\leq$ 10 mg/ℓ and/or (see Note 3)
and the substance is not rapidly degradable and/or the experimentally determined BCF is $\geq$ 500 (or, if absent the log $K_{ow} \geq 4$) (see Notes 4 and 5)	

Note 1: The organisms fish, crustacea and algae are tested as surrogate species covering a range of trophic levels and taxa, and the test methods are highly standardized. Data on other organisms may also be considered, however, provided they represent equivalent species and test endpoints.

Note 2: When classifying substances as Acute 1 and/or Chronic 1 it is necessary at the same time to indicate an appropriate M factor (see 2.9.3.4.6.4) to apply the summation method.

Note 3: Where the algal toxicity ErC50 (= EC_{50} (growth rate)) falls more than 100 times below the next most sensitive species and results in a classification based solely on this effect, consideration shall be given to whether this toxicity is representative of the toxicity to aquatic plants. Where it can be shown that this is not the case, professional judgment shall be used in deciding if classification shall be applied. Classification shall be based on the ErC_{50}. In circumstances where the basis of the EC_{50} is not specified and no ErC_{50} is recorded, classification shall be based on the lowest EC_{50} available.

Note 4: Lack of rapid degradability is based on either a lack of ready biodegradability or other evidence of lack of rapid degradation. When no useful data on degradability are available, either experimentally determined or estimated data, the substance shall be regarded as not rapidly degradable.

Note 5: Potential to bioaccumulate, based on an experimentally derived BCF $\geq$ 500 or, if absent, a log $K_{ow} \geq 4$ provided log K_{ow} is an appropriate descriptor for the bioaccumulation potential of the substance. Measured log K_{ow} values take precedence over estimated values and measured BCF values take precedence over log K_{ow} values.

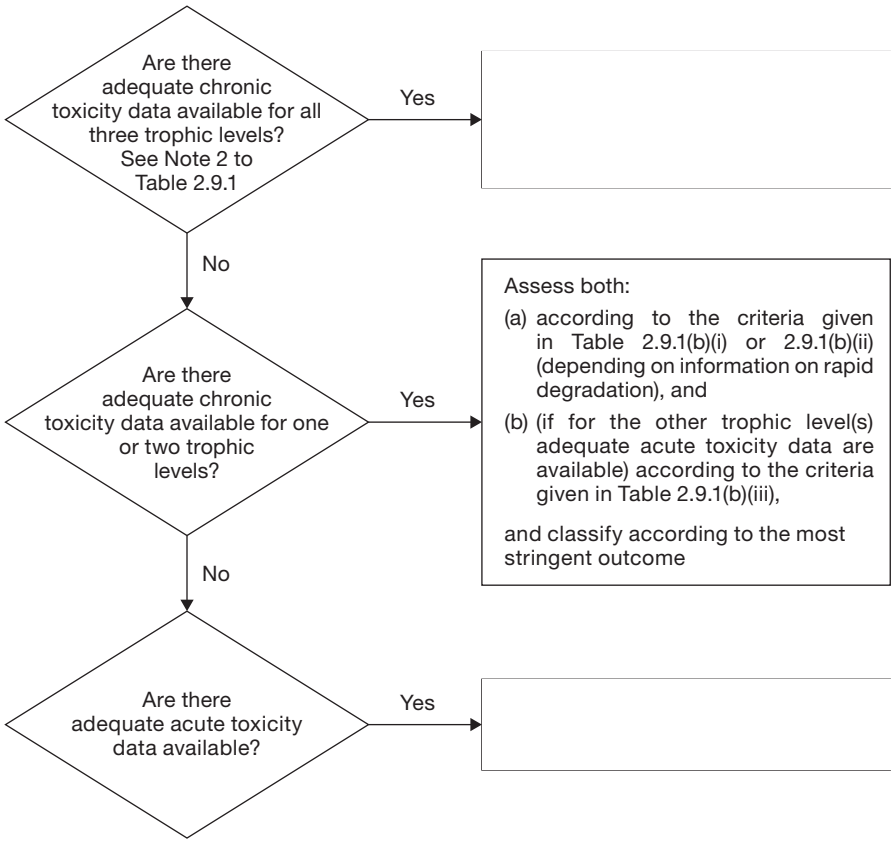


Figure 2.9.1 – *Categories for substances long-term hazardous to the aquatic environment*

2.9.3.3.2 The classification scheme in Table 2.9.2 below summarizes the classification criteria for substances.

Table 2.9.2 – Classification scheme for substances hazardous to the aquatic environment

Classification categories			
Acute hazard (see Note 1)	**Long-term hazard** (see Note 2)		
	Adequate chronic toxicity data available		**Adequate chronic toxicity data not available** (see Note 1)
	Non-rapidly degradable substances (see Note 3)	**Rapidly degradable substances** (see Note 3)	
Category: Acute 1	**Category: Chronic 1**	**Category: Chronic 1**	**Category: Chronic 1**
$L(E)C_{50} \leq 1.00$	NOEC or $EC_x \leq 0.1$	NOEC or $EC_x \leq 0.01$	$L(E)C_{50} \leq 1.00$ and lack of rapid degradability and/or BCF ≥ 500 or, if absent log $K_{ow} \geq 4$
	Category: Chronic 2	**Category: Chronic 2**	**Category: Chronic 2**
	$0.1 <$ NOEC or $EC_x \leq 1$	$0.01 <$ NOEC or $EC_x \leq 0.1$	$1.00 < L(E)C_{50} \leq 10.0$ and lack of rapid degradability and/or BCF ≥ 500 or, if absent log $K_{ow} \geq 4$

Note 1: Acute toxicity band based on L(E)C50 values in mg/ℓ for fish, crustacea and/or algae or other aquatic plants (or Quantitative Structure Activity Relationships (QSAR) estimation if no experimental data*).

Note 2: Substances are classified in the various chronic categories unless there are adequate chronic toxicity data available for all three trophic levels above the water solubility or above 1 mg/ℓ. ("Adequate" means that the data sufficiently cover the endpoint of concern. Generally this would mean measured test data, but in order to avoid unnecessary testing it can on a case by case basis also be estimated data, e.g., (Q)SAR, or for obvious cases expert judgment).

* Special guidance is provided in chapter 4.1, paragraph 4.1.2.13 and annex 9, section A9.6 of the GHS.

Note 3: Chronic toxicity band based on NOEC or equivalent EC_x values in mg/ℓ for fish or crustacea or other recognized measures for chronic toxicity.

2.9.3.4 Mixtures classification categories and criteria

2.9.3.4.1 The classification system for mixtures covers the classification categories which are used for substances, meaning categories Acute 1 and Chronic 1 and 2. In order to make use of all available data for purposes of classifying the aquatic environmental hazards of the mixture, the following assumption is made and is applied where appropriate:

The "relevant ingredients" of a mixture are those which are present in a concentration equal to or greater than 0.1% (by mass) for ingredients classified as Acute and/or Chronic 1 and equal to or greater than 1% for other ingredients, unless there is a presumption (e.g., in the case of highly toxic ingredients) that an ingredient present at less than 0.1% can still be relevant for classifying the mixture for aquatic environmental hazards.

2.9.3.4.2 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) the use of "summation of classified ingredients" and/or an "additivity formula".

Figure 2.9.2 below outlines the process to be followed.

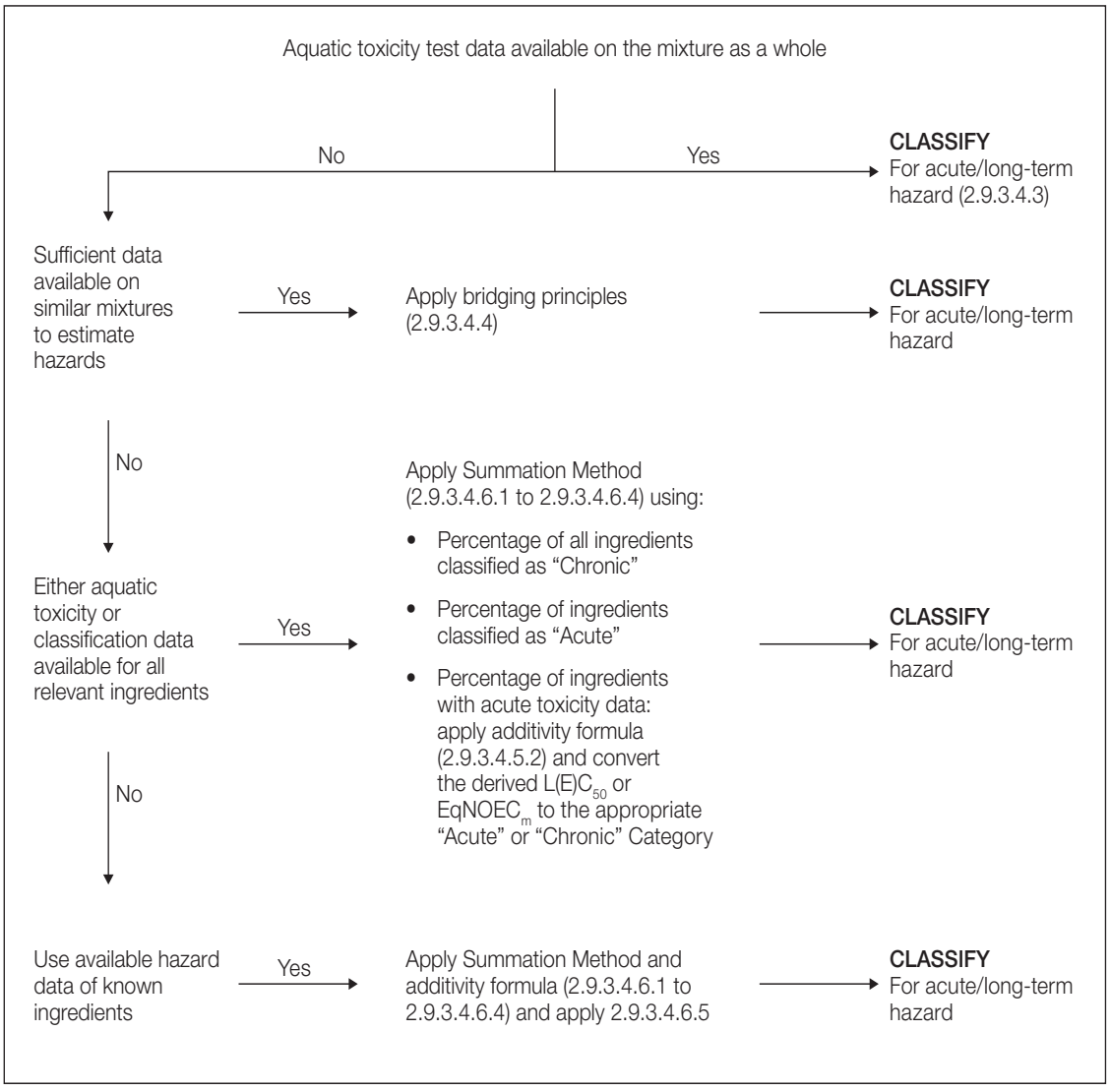


Figure 2.9.2 – *Tiered approach to classification of mixtures for acute and long-term aquatic environmental hazards*

2.9.3.4.3 *Classification of mixtures when toxicity data are available for the complete mixture*

2.9.3.4.3.1 When the mixture as a whole has been tested to determine its aquatic toxicity, this information shall be used for classifying the mixture according to the criteria that have been agreed for substances. The classification is normally based on the data for fish, crustacea and algae/plants (see 2.9.3.2.3 and 2.9.3.2.4). When adequate acute or chronic data for the mixture as a whole are lacking, "bridging principles" or "summation method" shall be applied (see 2.9.3.4.4 to 2.9.3.4.6).

2.9.3.4.3.2 The long-term hazard classification of mixtures requires additional information on degradability and in certain cases bioaccumulation. There are no degradability and bioaccumulation data for mixtures as a whole. Degradability and bioaccumulation tests for mixtures are not used as they are usually difficult to interpret, and such tests may be meaningful only for single substances.

2.9.3.4.3.3 Classification for category Acute 1

(a) When there are adequate acute toxicity test data (LC_{50} or EC_{50}) available for the mixture as a whole showing $L(E)C_{50} \leq 1$ mg/ℓ:

Classify the mixture as Acute 1 in accordance with Table 2.9.1 (a);

(b) When there are acute toxicity test data (LC_{50}(s) or EC_{50}(s) available for the mixture as a whole showing $L(E)C_{50}$(s) > 1 mg/l, or above the water solubility:

No need to classify for acute hazard under these Regulations.

2.9.3.4.3.4 Classification for categories Chronic 1 and 2

(a) When there are adequate chronic toxicity data (EC_x or NOEC) available for the mixture as a whole showing EC_x or NOEC of the tested mixture ≤ 1 mg/ℓ:

(i) classify the mixture as Chronic 1 or 2 in accordance with Table 2.9.1 (b)(ii) (rapidly degradable) if the available information allows the conclusion that all relevant ingredients of the mixture are rapidly degradable;

(ii) classify the mixture as Chronic 1 or 2 in all other cases in accordance with Table 2.9.1 (b)(i) (non-rapidly degradable);

(b) When there are adequate chronic toxicity data (EC_x or NOEC) available for the mixture as a whole showing EC_x(s) or NOEC(s) of the tested mixture > 1 mg/ℓ or above the water solubility:

No need to classify for long-term hazard under these Regulations.

2.9.3.4.4 *Classification of mixtures when toxicity data are not available for the complete mixture: bridging principles*

2.9.3.4.4.1 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.

2.9.3.4.4.2 *Dilution*

2.9.3.4.4.2.1 Where a new mixture is formed by diluting a tested 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 resulting mixture shall be classified as equivalent to the original tested mixture or substance. Alternatively, the method explained in 2.9.3.4.5 may be applied.

2.9.3.4.4.2.2 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.

2.9.3.4.4.3 *Batching*

2.9.3.4.4.3.1 The aquatic hazard classification of a tested production batch of a mixture shall be assumed to be substantially equivalent to that of another untested production batch of the same commercial product when 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 untested batch has changed. If the latter occurs, new classification is necessary.

2.9.3.4.4.4 *Concentration of mixtures which are classified with the most severe classification categories (Chronic 1 and Acute 1)*

2.9.3.4.4.4.1 If a tested mixture is classified as Chronic 1 and/or Acute 1, and the ingredients of the mixture which are classified as Chronic 1 and/or Acute 1 are further concentrated, the more concentrated untested mixture shall be classified with the same classification category as the original tested mixture without additional testing.

2.9.3.4.4.5 *Interpolation within one toxicity category*

2.9.3.4.4.5.1 For three mixtures (A, B and C) with identical ingredients, where mixtures A and B have been tested and are in the same toxicity category, and where untested mixture C has the same toxicologically active ingredients as mixtures A and B but has concentrations of toxicologically active ingredients intermediate to the concentrations in mixtures A and B, then mixture C is assumed to be in the same category as A and B.

2.9.3.4.4.6 *Substantially similar mixtures*

2.9.3.4.4.6.1 Given the following:

(a) Two mixtures:

(i) A + B

(ii) C + B

(b) The concentration of ingredient B is essentially the same in both mixtures;

(c) The concentration of ingredient A in mixture (i) equals that of ingredient C in mixture (ii);

(d) Data on aquatic hazards for A and C are available and are substantially equivalent, i.e. they are in the same hazard category and are not expected to affect the aquatic toxicity of B.

If mixture (i) or (ii) is already classified based on test data, then the other mixture can be assigned the same hazard category.

2.9.3.4.5 ***Classification of mixtures when toxicity data are available for all ingredients or only for some ingredients of the mixture***

2.9.3.4.5.1 The classification of a mixture shall be 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 2.9.3.4.6.1 to 2.9.3.4.6.4.1.

2.9.3.4.5.2 Mixtures may be made of a combination of both ingredients that are classified (as Acute 1 and/or Chronic 1, 2) and those for which adequate toxicity test data are available. When adequate toxicity data are available for more than one ingredient in the mixture, the combined toxicity of those ingredients shall be calculated using the following additivity formulas (a) or (b), depending on the nature of the toxicity data:

(a) Based on acute aquatic toxicity:

$$\frac{\sum C_i}{\mathrm{L(E)C}_{50m}} = \sum_n \frac{C_i}{\mathrm{L(E)C}_{50i}}$$

where: C_i = concentration of ingredient *i* (mass percentage);

$\mathrm{L(E)C}_{50i}$ = LC_{50} or EC_{50} for ingredient *i* (mg/ℓ);

n = number of ingredients, and *i* is running from 1 to *n*; and

$\mathrm{L(E)C}_{50m}$ = $\mathrm{L(E)C}_{50}$ of the part of the mixture with test data

The calculated toxicity shall be used to assign that portion of the mixture an acute hazard category which is then subsequently used in applying the summation method;

(b) Based on chronic aquatic toxicity:

$$\frac{\sum C_i + \sum C_j}{\mathrm{EqNOEC}_m} = \sum_{\mathrm{n}} \frac{C_i}{\mathrm{NOEC}_i} + \sum_{\mathrm{n}} \frac{C_j}{0.1 \times \mathrm{NOEC}_j}$$

where: C_i = concentration of ingredient *i* (mass percentage) covering the rapidly degradable ingredients;

C_j = concentration of ingredient *j* (mass percentage) covering the non-rapidly degradable ingredients;

NOEC_i = NOEC (or other recognized measures for chronic toxicity) for ingredient *i* covering the rapidly degradable ingredients, in mg/ℓ;

NOEC_j = NOEC (or other recognized measures for chronic toxicity) for ingredient *j* covering the non-rapidly degradable ingredients, in mg/ℓ;

n = number of ingredients, and i and j are running from 1 to n;

EqNOEC_m = equivalent NOEC of the part of the mixture with test data;

The equivalent toxicity thus reflects the fact that non-rapidly degrading substances are classified one hazard category level more "severe" than rapidly degrading substances.

The calculated equivalent toxicity shall be used to assign that portion of the mixture a long-term hazard category, in accordance with the criteria for rapidly degradable substances (Table 2.9.1 (b)(ii)), which is then subsequently used in applying the summation method.

2.9.3.4.5.3 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 ingredient toxicity values that relate to the same taxonomic group (i.e. fish, crustacea or algae) and then to use the highest toxicity (lowest value) obtained (i.e. use the most sensitive of the three groups). However, when toxicity data for each ingredient are not available in the same taxonomic group, 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 higher toxicity (from the most sensitive test organism) is used. The calculated acute and chronic toxicity shall then be used to classify this part of the mixture as Acute 1 and/or Chronic 1 or 2 using the same criteria described for substances.

2.9.3.4.5.4 If a mixture is classified in more than one way, the method yielding the more conservative result shall be used.

2.9.3.4.6 ***Summation method***

2.9.3.4.6.1 *Classification procedure*

2.9.3.4.6.1.1 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 results 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.

2.9.3.4.6.2 *Classification for the category Acute 1*

2.9.3.4.6.2.1 First, all ingredients classified as Acute 1 are considered. If the sum of the concentrations (in %) of these ingredients is greater than or equal to 25% the whole mixture shall be classified as Acute 1. If the result of the calculation is a classification of the mixture as Acute 1, the classification process is completed.

2.9.3.4.6.2.2 The classification of mixtures for acute hazards based on this summation of the concentrations of classified ingredients is summarized in Table 2.9.3 below.

Table 2.9.3 – Classification of a mixture for acute hazards based on summation of the concentrations of classified ingredients

Sum of the concentrations (in %) of ingredients classified as:	Mixture is classified as:
Acute 1 × $M^a \geq$ 25%	Acute 1

[a] For explanation of the M factor, see 2.9.3.4.6.4.

2.9.3.4.6.3 *Classification for categories Chronic 1 and 2*

2.9.3.4.6.3.1 First, all ingredients classified as Chronic 1 are considered. If the sum of the concentrations (in %) of these ingredients is greater than or equal to 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

2.9.3.4.6.3.2 In cases where the mixture is not classified as Chronic 1, classification of the mixture as Chronic 2 is considered. A mixture shall be classified as Chronic 2 if 10 times the sum of the concentrations (in %) of all ingredients classified as Chronic 1 plus the sum of the concentrations (in %) of all ingredients classified as Chronic 2 is greater than or equal to 25%. If the result of the calculation is classification of the mixture as Chronic 2, the classification process is completed.

2.9.3.4.6.3.3 The classification of mixtures for long-term hazards based on this summation of the concentrations of classified ingredients is summarized in Table 2.9.4 below.

Table 2.9.4 – Classification of a mixture for long-term hazards based on summation of the concentrations of classified ingredients

Sum of the concentrations (in %) of ingredients classified as:	Mixture classified as:
Chronic 1 × $M^a \geq$ 25%	Chronic 1
(M × 10 × Chronic 1) + Chronic 2 ≥ 25%	Chronic 2

[a] For explanation of the *M* factor, see 2.9.3.4.6.4.

2.9.3.4.6.4 *Mixtures with highly toxic ingredients*

2.9.3.4.6.4.1 Acute 1 or Chronic 1 ingredients with acute toxicities well below 1 mg/l and/or chronic toxicities well below 0.1 mg/l (if non-rapidly degradable) and 0.01 mg/l (if rapidly degradable) may influence the toxicity of the mixture and are given increased weight in applying the summation method. When a mixture contains ingredients classified as Acute 1 or Chronic 1, the tiered approach described in 2.9.3.4.6.2 and 2.9.3.4.6.3 shall be applied using a weighted sum by multiplying the concentrations of Acute 1 and Chronic 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 2.9.3 and the concentration of "Chronic 1" in the left column of Table 2.9.4 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 2.9.5 below. Therefore, in order to classify a mixture containing Acute 1 and/or 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 (2.9.3.4.5.2) 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 and/or chronic toxicity data are not available, are of low or no toxicity and do not significantly contribute to the environmental hazard of the mixture.

Table 2.9.5 – Multiplying factors for highly toxic ingredients of mixtures

Acute toxicity	M factor	Chronic toxicity	M factor	
$L(E)C_{50}$ value		NOEC value	NRD[a] ingredients	RD[b] ingredients
$0.1 < L(E)C_{50} \leq 1$	1	$0.01 < NOEC \leq 0.1$	1	-
$0.01 < L(E)C_{50} \leq 0.1$	10	$0.001 < NOEC \leq 0.01$	10	1
$0.001 < L(E)C_{50} \leq 0.01$	100	$0.0001 < NOEC \leq 0.001$	100	10
$0.0001 < L(E)C_{50} \leq 0.001$	1 000	$0.00001 < NOEC \leq 0.0001$	1 000	100
$0.00001 < L(E)C_{50} \leq 0.0001$	10 000	$0.000001 < NOEC \leq 0.00001$	10 000	1 000
(continue in factor 10 intervals)		(continue in factor 10 intervals)		

[a] Non-rapidly degradable.

[b] Rapidly degradable.

2.9.3.4.6.5 *Classification of mixtures with ingredients without any useable information*

2.9.3.4.6.5.1 In the event that no useable information on acute and/or chronic aquatic toxicity 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: "x percent of the mixture consists of ingredient(s) of unknown hazards to the aquatic environment."

2.9.4 Lithium batteries

Cells and batteries, cells and batteries contained in equipment, or cells and batteries packed with equipment, containing lithium in any form shall be assigned to UN Nos. 3090, 3091, 3480 or 3481 as appropriate. They may be transported under these entries if they meet the following provisions:

.1 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. However batteries and cells manufactured before 1 January 2014 and conforming to a design type tested according to requirements of the 5th revised edition of the Manual of test and criteria, part III, sub section 38.3 may continue to be transported;

Note: Batteries shall be of a design type proved to meet the testing requirements of the *Manual of Tests and Criteria*, Part III, sub section 38.3, irrespective of whether the cells of which they are composed are of a tested design type.

.2 Each cell and battery incorporates a safety venting device or is designed to preclude a violent rupture under conditions normally incident to transport;

.3 Each cell and battery is equipped with an effective means of preventing external short circuits;

.4 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.);

.5 Cells and batteries shall be manufactured under a quality management programme that includes:

(i) A description of the organizational structure and responsibilities of personnel with regard to design and product quality;

(ii) The relevant inspection and test, quality control, quality assurance, and process operation instructions that will be used;

(iii) Process controls that should include relevant activities to prevent and detect internal short circuit failure during manufacture of cells;

(iv) Quality records, such as inspection reports, test data, calibration data and certificates. Test data shall be kept and made available to the competent authority upon request;

(v) Management reviews to ensure the effective operation of the quality management programme;

(vi) A process for control of documents and their revision;

(vii) A means for control of cells or batteries that are not conforming to the type tested as mentioned in (.1) above;

(viii) Training programmes and qualification procedures for relevant personnel; and

(ix) Procedures to ensure that there is no damage to the final product.

Note: In house quality management programmes may be accepted. Third party certification is not required, but the procedures listed in (i) to (ix) above shall be properly recorded and traceable. A copy of the quality management programme shall be made available to the competent authority upon request.

Chapter 2.10

Marine pollutants

2.10.1 Definition

Marine pollutants means substances which are subject to the provisions of Annex III of MARPOL 73/78, as amended.

2.10.2 General provisions

2.10.2.1 Marine pollutants shall be transported under the provisions of Annex III of MARPOL 73/78, as amended.

2.10.2.2 The Index indicates by the symbol P in the column headed **MP** those substances, materials and articles that are identified as marine pollutants.

2.10.2.3 Marine pollutants shall be transported under the appropriate entry according to their properties if they fall within the criteria of any of the classes 1 to 8. If they do not fall within the criteria of any of these classes, they shall be transported under the entry: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., UN 3077 or ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., UN 3082, as appropriate, unless there is a specific entry in class 9.

2.10.2.4 Column 4 of the Dangerous Goods List also provides information on marine pollutants using the symbol P.

2.10.2.5 When a substance, material or article possesses properties that meet the criteria of a marine pollutant but is not identified in this Code, such substance, material or article shall be transported as a marine pollutant in accordance with the Code.

2.10.2.6 With the approval of the competent authority (see 7.9.2), substances, materials or articles that are identified as marine pollutants in this Code but which no longer meet the criteria as a marine pollutant need not be transported in accordance with the provisions of this Code applicable to marine pollutants.

2.10.3 Classification

2.10.3.1 Marine pollutants shall be classified in accordance with chapter 2.9.3.

PART 3

DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND EXCEPTIONS

Chapter 3.1

General

3.1.1 Scope and general provisions

3.1.1.1 The Dangerous Goods List in chapter 3.2 lists many of the dangerous goods most commonly transported. The list includes entries for specific chemical substances and articles and generic or "not otherwise specified" entries. Since it is not practical to include a separate entry for every chemical substance or article of commercial importance specifically by name, especially names for mixtures and solutions of various chemical constituents and concentrations, the Dangerous Goods List also includes generic or "not otherwise specified" names (e.g., EXTRACTS, FLAVOURING, LIQUID, UN 1197 or FLAMMABLE LIQUID, N.O.S., UN 1993). On this basis, the Dangerous Goods List is intended to include an appropriate name or entry for any dangerous good which may be transported.

3.1.1.2 Where a dangerous good is specifically listed by name in the Dangerous Goods List, it shall be transported in accordance with the provisions in the List which are appropriate for that dangerous good. A generic or "not otherwise specified" entry may be used to permit the transport of substances, materials or articles which do not appear specifically by name in the Dangerous Goods List. Such a dangerous good may be transported only after its dangerous properties have been determined. Dangerous goods shall be classified according to the class definitions, tests and criteria. The name which most appropriately describes the dangerous goods shall be used. Only when the specific name of the dangerous goods does not appear in the Dangerous Goods List or the associated primary or subsidiary hazards assigned to it are not appropriate may a generic or "not otherwise specified" name be used. The classification shall be made by the shipper/consignor or by the appropriate competent authority where so specified in the Code. Once the class of the dangerous good has been so established, all conditions for transport, as provided in this Code, shall be met. Any dangerous good having or suspected of having explosive characteristics shall first be considered for inclusion in class 1. Some collective entries may be of the generic or "not otherwise specified" type provided that the Code contains provisions ensuring safety, both by excluding extremely dangerous goods from normal transport and by covering all subsidiary risks inherent in some goods.

3.1.1.3 Inherent instability in goods may take different dangerous forms, for example explosion, polymerization with intense evolution of heat or emission of flammable, toxic, corrosive or asphyxiant gases. The Dangerous Goods List indicates that certain dangerous goods, or dangerous goods in a specific form, concentration or state, are prohibited for transport by sea. This means that the goods specified are not suitable for transport by sea under normal conditions of transport. This does not mean that such goods may not be transported under any circumstances. For most goods, such inherent instability can be controlled by suitable packaging, dilution, stabilization, addition of an inhibitor, temperature control or other measures.

3.1.1.4 Where precautionary measures are laid down in the Dangerous Goods List in respect of a given dangerous good (such as that it shall be "stabilized" or "with *x*% water or phlegmatizer"), such dangerous good may not normally be transported when these measures have not been taken, unless the item in question is listed elsewhere (such as class 1) without any indication of, or with different, precautionary measures.

3.1.1.5 Certain substances, by the nature of their chemical composition, tend to polymerize or otherwise react in a dangerous manner under certain conditions of temperature or in contact with a catalyst. Mitigation of this tendency can be carried out either by requiring special transport conditions or by adding adequate amounts of chemical inhibitors or stabilizers to the product. These products shall be sufficiently stabilized to prevent any dangerous reaction during the intended voyage. If this cannot be ensured, the transport of such products is prohibited.

3.1.1.6 Where the contents of a portable tank is to be transported heated, the transport temperature is to be maintained during the intended voyage unless it is established that crystallization or solidification on cooling would not result in instability, which can occur with some stabilized or inhibited products.

3.1.2 Proper Shipping Names

Note 1: The Proper Shipping Names of the dangerous goods are those listed in chapter 3.2, Dangerous Goods List. Synonyms, secondary names, initials, abbreviations of names, etc. have been included in the Index to facilitate the search for the Proper Shipping Name (see part 5, Consignment Procedures).

Note 2: For Proper Shipping Names to be used for transport of samples, see 2.0.4. For Proper Shipping Names to be used for transport of wastes, see 5.4.1.4.3.3.

3.1.2.1 The Proper Shipping Name is that portion of the entry most accurately describing the goods in the Dangerous Goods List, 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). An alternative Proper Shipping Name may be shown in brackets following the main Proper Shipping Name (such as ETHANOL (ETHYL ALCOHOL)). Portions of an entry appearing in lower case need not be considered as part of the Proper Shipping Name but may be used.

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:

.1 UN 1057 LIGHTERS or LIGHTER REFILLS – The Proper Shipping Name is the most appropriate of the following possible combinations:

LIGHTERS

LIGHTER REFILLS;

.2 UN 2583 ALKYLSULPHONIC ACIDS, SOLID or ARYLSULPHONIC ACIDS, SOLID with more than 5% free sulphuric acid – The Proper Shipping Name is the most appropriate of the following:

ALKYLSULPHONIC ACIDS, SOLID

ARYLSULPHONIC ACIDS, SOLID;

.3 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 packages is optional. Commercial or military names for goods of class 1, which contain the Proper Shipping Name supplemented by additional text, may be used.

3.1.2.4 Many substances have an entry for both the liquid and solid state (see definitions for *liquids* and *solids* in 1.2.1), or for the solid and solution. These are allocated separate UN Numbers which are not necessarily adjacent to each other. Details are provided in the alphabetical index, e.g.:

NITROXYLENES, LIQUID	–	6.1	1665
NITROXYLENES, SOLID	–	6.1	3447.

3.1.2.5 Where it is not already included, the qualifying word "MOLTEN" shall be added to the Proper Shipping Name when a substance which is solid in accordance with the definition in 1.2.1 is offered for transport in the molten state (such as ALKYLPHENOL, SOLID, N.O.S., MOLTEN). For elevated temperature substances, see 5.4.1.4.3.4.

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 the Dangerous Goods List, the word STABILIZED shall be added as part of the Proper Shipping Name of the substance which without stabilization would be forbidden from transport in accordance with 1.1.3 due to it being liable to dangerously react under conditions normally encountered in transport (such as 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:

.1 For liquids: where the SADT is less than or equal to 50°C, the provisions of 7.3.7.5 shall apply;

.2 For gases: the conditions of transport shall be approved by the competent authority.

3.1.2.7 Hydrates may be transported under the Proper Shipping Name for the anhydrous substance.

3.1.2.8 Generic or "not otherwise specified" (N.O.S.) entries

3.1.2.8.1 Generic and "not otherwise specified" Proper Shipping Names that are assigned to special provision 274 or 318 in column 6 of the Dangerous Goods List shall be supplemented with the technical or chemical group names unless a national law or international convention prohibits its disclosure if it is a controlled substance. For explosives of class 1, the dangerous goods description may be supplemented by additional descriptive text to indicate commercial or military names. Technical and chemical group 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, PG II".

3.1.2.8.1.1 The technical name shall be a recognized chemical or 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 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 the Dangerous Goods List, 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 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 brackets shall be the name of the constituent which compels the use of the subsidiary risk label.

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).

3.1.2.9 Marine pollutants

3.1.2.9.1 For generic or "not otherwise specified" (N.O.S.) entries, the Proper Shipping Name shall be supplemented with the recognized chemical name of the marine pollutant.

3.1.2.9.2 Examples illustrating the selection of the Proper Shipping Name supplemented with the recognized technical name of goods for such entries are indicated below:

UN 1993 FLAMMABLE LIQUID, N.O.S. (propyl acetate, di-n-butyltin di-2-ethylhexanoate) class 3 PG III (50°C c.c.) MARINE POLLUTANT

UN 1263 PAINT (triethylbenzene) class 3 PG III (27°C c.c.) MARINE POLLUTANT

3.1.3 Mixtures or solutions

Note: Where a substance is specifically listed by name in the Dangerous Goods List, it shall be identified in transport by the Proper Shipping Name in the Dangerous Goods List. Such substances may contain technical impurities (for example those deriving from the production process) or additives for stability or other purposes that do not affect their classification. However, a substance listed by name containing technical impurities or additives for stability or other purposes affecting its classification shall be considered a mixture or solution (see 2.0.2.2 and 2.0.2.5).

3.1.3.1 A mixture or solution is not subject to the provisions of this Code if the characteristics, properties, form or physical state of the mixture or solution are such that it does not meet the criteria, including human experience criteria, for inclusion in any class.

3.1.3.2 A mixture or solution meeting the classification criteria of this Code composed of a single predominant substance identified by name in the Dangerous Goods List and one or more substances not subject to the provisions of this Code and/or traces of one or more substances identified by name in the Dangerous Goods List, shall be assigned the UN Number and Proper Shipping Name of the predominant substance named in the Dangerous Goods List unless:

.1 the mixture or solution is identified by name in the Dangerous Goods List;

.2 the name and description of the substance named in the Dangerous Goods List specifically indicate that they apply only to the pure substance;

.3 the hazard class or division, subsidiary risk(s), packing group, or physical state of the mixture or solution is different from that of the substance named in the Dangerous Goods List; or

.4 the hazard characteristics and properties of the mixture or solution necessitate emergency response measures that are different from those required for the substance identified by name in the Dangerous Goods List.

3.1.3.3 Qualifying words such as “MIXTURE” or “SOLUTION”, as appropriate, shall be added as part of the Proper Shipping Name, for example, “ACETONE SOLUTION”. In addition, the concentration of the mixture or solution may also be indicated after the basic description of the mixture or solution, for example, “ACETONE 75% SOLUTION”.

3.1.3.4 A mixture or solution meeting the classification criteria of this Code that is not identified by name in the Dangerous Goods List and that is composed of two or more dangerous goods shall be assigned to an entry that has the Proper Shipping Name, description, hazard class or division, subsidiary risk(s) and packing group that most precisely describe the mixture or solution.

3.1.4 Segregation groups

3.1.4.1 For the purpose of segregation, dangerous goods having certain similar chemical properties have been grouped together in segregation groups, see 7.2.5. Where, in the Dangerous Goods List entry in column 16 (stowage and segregation), a particular segregation requirement refers to a group of substances, the particular segregation requirement applies to the goods allocated to the respective segregation group.

3.1.4.2 It is recognized that not all substances, mixtures, solutions or preparations falling within a segregation group are listed in the IMDG Code by name. These are shipped under N.O.S. entries. Although these N.O.S. entries are not themselves listed in the segregation groups (see 3.1.4.4), the consignor shall decide whether inclusion under the segregation group is appropriate and, if so, shall mention that fact in the transport document (see 5.4.1.5.11).

3.1.4.3 The segregation groups in this Code do not cover substances which fall outside the classification criteria of the Code. It is recognized that some non-hazardous substances have similar chemical properties as substances listed in the segregation groups. A consignor or the person responsible for packing the goods into a cargo transport unit who does have knowledge of the chemical properties of such non-dangerous goods may decide to implement the segregation provisions of a related segregation group on a voluntary basis.

3.1.4.4 The following segregation groups are identified.

1 Acids

1052 Hydrogen fluoride, anhydrous*
1182 Ethyl chloroformate
1183 Ethyldichlorosilane
1238 Methyl chloroformate
1242 Methyldichlorosilane
1250 Methyltrichlorosilane
1295 Trichlorosilane
1298 Trimethylchlorosilane
1305 Vinyltrichlorosilane
1572 Cacodylic acid
1595 Dimethyl sulphate
1715 Acetic anhydride
1716 Acetyl bromide
1717 Acetyl chloride
1718 Butyl acid phosphate
1722 Allyl chloroformate
1723 Allyl iodide
1724 Allyltrichlorosilane, stabilized
1725 Aluminium bromide, anhydrous
1726 Aluminium chloride, anhydrous
1727 Ammonium hydrogendifluoride, solid
1728 Amyltrichlorosilane
1729 Anisoyl chloride
1730 Antimony pentachloride, liquid
1731 Antimony pentachloride solution
1732 Antimony pentafluoride

1733 Antimony trichloride
1736 Benzoyl chloride
1737 Benzyl bromide
1738 Benzyl chloride
1739 Benzyl chloroformate
1740 Hydrogendifluorides, n.o.s.
1742 Boron trifluoride acetic acid complex, liquid
1743 Boron trifluoride propionic acid complex, liquid
1744 Bromine or bromine solution
1745 Bromine pentafluoride
1746 Bromine trifluoride
1747 Butyltrichlorosilane
1750 Chloroacetic acid solution
1751 Chloroacetic acid, solid
1752 Chloroacetyl chloride
1753 Chlorophenyltrichlorosilane
1754 Chlorosulphonic acid (with or without sulphur trioxide)
1755 Chromic acid solution
1756 Chromic fluoride, solid
1757 Chromic fluoride solution
1758 Chromium oxychloride
1762 Cyclohexenyltrichlorosilane
1763 Cyclohexyltrichlorosilane
1764 Dichloroacetic acid
1765 Dichloroacetyl chloride
1766 Dichlorophenyltrichlorosilane
1767 Diethyldichlorosilane
1768 Difluorophosphoric acid, anhydrous
1769 Diphenyldichlorosilane
1770 Diphenylmethyl bromide
1771 Dodecyltrichlorosilane
1773 Ferric chloride, anhydrous
1775 Fluoroboric acid
1776 Fluorophosphoric acid, anhydrous
1777 Fluorosulphonic acid*
1778 Fluorosilicic acid
1779 Formic acid with more than 85% acid by mass
1780 Fumaryl chloride
1781 Hexadecyltrichlorosilane
1782 Hexafluorophosphoric acid
1784 Hexyltrichlorosilane
1786 Hydrofluoric acid and sulphuric acid mixture*
1787 Hydriodic acid*
1788 Hydrobromic acid*
1789 Hydrochloric acid*
1790 Hydrofluoric acid*
1792 Iodine monochloride, solid
1793 Isopropyl acid phosphate
1794 Lead sulphate with more than 3% free acid
1796 Nitrating acid mixture*

1798	Nitrohydrochloric acid*
1799	Nonyltrichlorosilane
1800	Octadecyltrichlorosilane
1801	Octyltrichlorosilane
1802	Perchloric acid with not more than 50% acid, by mass*
1803	Phenolsulphonic acid, liquid
1804	Phenyltrichlorosilane
1805	Phosphoric acid, solution
1806	Phosphorus pentachloride
1807	Phosphorus pentoxide
1808	Phosphorus tribromide
1809	Phosphorus trichloride
1810	Phosphorus oxychloride
1811	Potassium hydrogendifluoride, solid
1815	Propionyl chloride
1816	Propyltrichlorosilane
1817	Pyrosulphuryl chloride
1818	Silicon tetrachloride
1826	Nitrating acid mixture, spent*
1827	Stannic chloride, anhydrous
1828	Sulphur chlorides
1829	Sulphur trioxide, inhibited or sulphur trioxide, stabilized
1830	Sulphuric acid with more than 51% acid*
1831	Sulphuric acid, fuming*
1832	Sulphuric acid, spent*
1833	Sulphurous acid
1834	Sulphuryl chloride
1836	Thionyl chloride
1837	Thiophosphoryl chloride
1838	Titanium tetrachloride
1839	Trichloroacetic acid
1840	Zinc chloride solution
1848	Propionic acid with not less than 10% and less than 90% acid, by mass
1873	Perchloric acid with more than 50% but not more than 72% acid, by mass*
1898	Acetyl iodide
1902	Diisooctyl acid phosphate
1905	Selenic acid
1906	Sludge acid*
1938	Bromoacetic acid solution
1939	Phosphorus oxybromide
1940	Thioglycolic acid
2031	Nitric acid, other than red fuming*
2032	Nitric acid, red fuming*
2214	Phthalic anhydride with more than 0.05% of maleic anhydride
2215	Maleic anhydride
2218	Acrylic acid, inhibited
2225	Benzenesulphonyl chloride
2226	Benzotrichloride
2240	Chromosulphuric acid*
2262	Dimethylcarbamoyl chloride

2267 Dimethyl thiophosphoryl chloride
2305 Nitrobenzenesulphonic acid
2308 Nitrosylsulphuric acid, liquid*
2331 Zinc chloride, anhydrous
2353 Butyryl chloride
2395 Isobutyryl chloride
2407 Isopropyl chloroformate
2434 Dibenzyldichlorosilane
2435 Ethylphenyldichlorosilane
2437 Methylphenyldichlorosilane
2438 Trimethylacetyl chloride
2439 Sodium hydrogendifluoride
2440 Stannic chloride pentahydrate
2442 Trichloroacetyl chloride
2443 Vanadium oxytrichloride
2444 Vanadium tetrachloride
2475 Vanadium trichloride
2495 Iodine pentafluoride
2496 Propionic anhydride
2502 Valeryl chloride
2503 Zirconium tetrachloride
2506 Ammonium hydrogen sulphate
2507 Chloroplatinic acid, solid
2508 Molybdenum pentachloride
2509 Potassium hydrogen sulphate
2511 2-Chloropropionic acid
2513 Bromoacetyl bromide
2531 Methacrylic acid, stabilized
2564 Trichloroacetic acid solution
2571 Alkylsulphuric acids
2576 Phosphorus oxybromide, molten
2577 Phenylacetyl chloride
2578 Phosphorus trioxide
2580 Aluminium bromide solution
2581 Aluminium chloride solution
2582 Ferric chloride solution
2583 Alkylsulphonic acids, solid or arylsulphonic acids, solid with more than 5% free sulphuric acid
2584 Alkylsulphonic acids, liquid or arylsulphonic acids, liquid with more than 5% free sulphuric acid
2585 Alkylsulphonic acids, solid or arylsulphonic acids, solid with not more than 5% free sulphuric acid
2586 Alkylsulphonic acids, liquid or arylsulphonic acids, liquid with not more than 5% free sulphuric acid
2604 Boron trifluoride diethyl etherate
2626 Chloric acid, aqueous solution with not more than 10% chloric acid
2642 Fluoroacetic acid
2670 Cyanuric chloride
2691 Phosphorus pentabromide
2692 Boron tribromide
2698 Tetrahydrophthalic anhydrides with more than 0.05% maleic anhydride
2699 Trifluoroacetic acid
2739 Butyric anhydride

2740	Propyl chloroformate
2742	Chloroformates, toxic, corrosive, flammable, n.o.s.
2743	*n*-Butyl chloroformate
2744	Cyclobutyl chloroformate
2745	Chloromethyl chloroformate
2746	Phenyl chloroformate
2748	2-Ethylhexyl chloroformate
2751	Diethylthiophosphoryl chloride
2789	Acetic acid, glacial or acetic acid solution, more than 80% acid, by mass
2790	Acetic acid solution, more than 10% but not more than 80% acid, by mass
2794	Batteries, wet, filled with acid electric storage
2796	Sulphuric acid with not more than 51% acid or battery fluid, acid*
2798	Phenylphosphorus dichloride
2799	Phenylphosphorus thiodichloride
2802	Copper chloride
2817	Ammonium hydrogendifluoride solution
2819	Amyl acid phosphate
2820	Butyric acid
2823	Crotonic acid, solid
2826	Ethyl chlorothioformate
2829	Caproic acid
2834	Phosphorous acid
2851	Boron trifluoride dihydrate
2865	Hydroxylamine sulphate
2869	Titanium trichloride mixture
2879	Selenium oxychloride
2967	Sulphamic acid
2985	Chlorosilanes, flammable, corrosive, n.o.s.
2986	Chlorosilanes, corrosive, flammable, n.o.s.
2987	Chlorosilanes, corrosive, n.o.s.
2988	Chlorosilanes, water-reactive, flammable, corrosive, n.o.s.
3246	Methanesulphonyl chloride
3250	Chloroacetic acid, molten
3260	Corrosive solid, acidic, inorganic, n.o.s.
3261	Corrosive solid, acidic, organic, n.o.s.
3264	Corrosive liquid, acidic, inorganic, n.o.s.
3265	Corrosive liquid, acidic, organic, n.o.s.
3277	Chloroformates, toxic, corrosive, n.o.s.
3361	Chlorosilanes, toxic, corrosive, n.o.s.
3362	Chlorosilanes, toxic, corrosive, flammable, n.o.s.
3412	Formic acid with not less than 10% but not more than 85% acid by mass
3412	Formic acid with not less than 5% but not more than 10% acid by mass
3419	Boron trifluoride acetic acid complex, solid
3420	Boron trifluoride propionic acid complex, solid
3421	Potassium hydrogendifluoride solution
3425	Bromoacetic acid, solid
3453	Phosphoric acid, solid
3456	Nitrosylsulphuric acid, solid
3463	Propionic acid with not less than 90% acid by mass
3472	Crotonic acid, liquid
3498	Iodine monochloride, liquid

* identifies strong acids

2 **Ammonium compounds**

0004 Ammonium picrate dry or wetted with less than 10% water, by mass
0222 Ammonium nitrate, with more than 0.2% combustible substances
0402 Ammonium perchlorate
1310 Ammonium picrate, wetted with not less than 10% water, by mass
1439 Ammonium dichromate
1442 Ammonium perchlorate
1444 Ammonium persulphate
1512 Zinc ammonium nitrite
1546 Ammonium arsenate
1630 Mercury ammonium chloride
1727 Ammonium hydrogendifluoride, solid
1835 Tetramethylammonium hydroxide solution
1843 Ammonium dinitro-*o*-cresolate, solid
1942 Ammonium nitrate with not more than 0.2% combustible substances
2067 Ammonium nitrate based fertilizer
2071 Ammonium nitrate based fertilizer
2073 Ammonia solution, relative density less than 0.880 at 15°C in water, with more than 35% but not more than 50% ammonia
2426 Ammonium nitrate, liquid (hot concentrated solution)
2505 Ammonium fluoride
2506 Ammonium hydrogen sulphate
2683 Ammonium sulphide solution
2687 Dicyclohexylammonium nitrite
2817 Ammonium hydrogendifluoride solution
2818 Ammonium polysulphide solution
2854 Ammonium fluorosilicate
2859 Ammonium metavanadate
2861 Ammonium polyvanadate
2863 Sodium ammonium vanadate
3375 Ammonium nitrate emulsion or suspension or gel intermediate for blasting explosives
3423 Tetramethylammonium hydroxide, solid
3424 Ammonium dinitro-*o*-cresolate solution

3 **Bromates**

1450 Bromates, inorganic, n.o.s.
1473 Magnesium bromate
1484 Potassium bromate
1494 Sodium bromate
2469 Zinc bromate
2719 Barium bromate
3213 Ammonium bromate
3213 Bromates, inorganic, aqueous solution, n.o.s.

4 **Chlorates**

1445 Barium chlorate, solid
1452 Calcium chlorate
1458 Chlorate and borate mixture
1459 Chlorate and magnesium chloride mixture, solid
1461 Chlorates, inorganic, n.o.s.
1485 Potassium chlorate

1495 Sodium chlorate
1506 Strontium chlorate
1513 Zinc chlorate
2427 Potassium chlorate, aqueous solution
2428 Sodium chlorate, aqueous solution
2429 Calcium chlorate, aqueous solution
2573 Thallium chlorate
2721 Copper chlorate
2723 Magnesium chlorate
3405 Barium chlorate solution
3407 Chlorate and magnesium chloride mixture solution

5 Chlorites

1453 Calcium chlorite
1462 Chlorites, inorganic, n.o.s.
1496 Sodium chlorite
1908 Chlorite solution

6 Cyanides

1541 Acetone cyanhydrin, stabilized
1565 Barium cyanide
1575 Calcium cyanide
1587 Copper cyanide
1588 Cyanides, inorganic, solid, n.o.s.
1620 Lead cyanide
1626 Mercuric potassium cyanide
1636 Mercury cyanide
1642 Mercury oxycyanide, desensitized
1653 Nickel cyanide
1679 Potassium cuprocyanide
1680 Potassium cyanide, solid
1684 Silver cyanide
1689 Sodium cyanide, solid
1694 Bromobenzyl cyanides, liquid
1713 Zinc cyanide
1889 Cyanogen bromide
1935 Cyanide solution, n.o.s.
2205 Adiponitrile
2316 Sodium cuprocyanide, solid
2317 Sodium cuprocyanide solution
3413 Potassium cyanide solution
3414 Sodium cyanide solution
3449 Bromobenzyl cyanides, solid

7 Heavy metals and their salts (including their organometallic compounds)

0129 Lead azide, wetted, with not less than 20% water, or mixture of alcohol and water, by mass
0130 Lead styphnate (lead trinitroresorcinate), wetted with not less than 20% water, or mixture of alcohol and water, by mass
0135 Mercury fulminate, wetted with not less than 20% water, or mixture of alcohol and water, by mass
1347 Silver picrate, wetted with not less than 30% water, by mass
1366 Diethylzinc
1370 Dimethylzinc

1389	Alkali metal amalgam, liquid
1392	Alkaline earth metal amalgam, liquid
1435	Zinc ashes
1436	Zinc dust or zinc powder
1469	Lead nitrate
1470	Lead perchlorate, solid
1493	Silver nitrate
1512	Zinc ammonium nitrite
1513	Zinc chlorate
1514	Zinc nitrate
1515	Zinc permanganate
1516	Zinc peroxide
1587	Copper cyanide
1616	Lead acetate
1617	Lead arsenates
1618	Lead arsenites
1620	Lead cyanide
1623	Mercuric arsenate
1624	Mercuric chloride
1625	Mercuric nitrate
1626	Mercuric potassium cyanide
1627	Mercurous nitrate
1629	Mercury acetate
1630	Mercury ammonium chloride
1631	Mercury benzoate
1634	Mercury bromides
1636	Mercury cyanide
1637	Mercury gluconate
1638	Mercury iodide
1639	Mercury nucleate
1640	Mercury oleate
1641	Mercury oxide
1642	Mercury oxycyanide, desensitized
1643	Mercury potassium iodide
1644	Mercury salicylate
1645	Mercury sulphate
1646	Mercury thiocyanate
1649	Motor fuel anti-knock mixture
1653	Nickel cyanide
1674	Phenylmercuric acetate
1683	Silver arsenite
1684	Silver cyanide
1712	Zinc arsenate and zinc arsenite mixture
1713	Zinc cyanide
1714	Zinc phosphide
1794	Lead sulphate with more than 3% free acid
1838	Titanium tetrachloride
1840	Zinc chloride solution
1872	Lead dioxide
1894	Phenylmercuric hydroxide

1895 Phenylmercuric nitrate
1931 Zinc hydrosulphite
1931 Zinc dithionite
2024 Mercury compound, liquid, n.o.s.
2025 Mercury compound, solid, n.o.s.
2026 Phenylmercuric compound, n.o.s.
2291 Lead compound, soluble, n.o.s.
2331 Zinc chloride, anhydrous
2441 Titanium trichloride, pyrophoric or titanium trichloride mixture, pyrophoric
2469 Zinc bromate
2546 Titanium powder, dry
2714 Zinc resinate
2777 Mercury based pesticide, solid, toxic
2778 Mercury based pesticide, liquid, flammable, toxic
2809 Mercury
2855 Zinc fluorosilicate
2869 Titanium trichloride mixture
2878 Titanium, sponge granules or titanium, sponge powders
2881 Metal catalyst, dry
2989 Lead phosphite, dibasic
3011 Mercury based pesticide, liquid, toxic, flammable
3012 Mercury based pesticide, liquid, toxic
3089 Metal powder, flammable, n.o.s.
3174 Titanium disulphide
3181 Metal salts of organic compounds, flammable, n.o.s.
3189 Metal powder, self-heating, n.o.s.
3401 Alkali metal amalgam, solid
3402 Alkaline earth metal amalgam, solid
3408 Lead perchlorate solution
3483 Motor fuel anti-knock mixture, flammable

8 Hypochlorites

1471 Lithium hypochlorite
1748 Calcium hypochlorite mixture
1791 Hypochlorite solution
2208 Calcium hypochlorite mixture, dry with more than 10% but not more than 39% available chlorine
2741 Barium hypochlorite with more than 22% available chlorine
2880 Calcium hypochlorite, hydrated or calcium hypochlorite, hydrated mixture with not less than 5.5% but not more than 16% water
3212 Hypochlorites, inorganic, n.o.s.
3255 *tert*-Butyl hypochlorite
3485 Calcium hypochlorite, dry, corrosive or calcium hypochlorite mixture, dry, corrosive with more than 39% available chlorine (8.8% available oxygen)
3486 Calcium hypochlorite mixture, dry, corrosive with more than 10% but not more than 39% available chlorine
3487 Calcium hypochlorite, hydrated, corrosive or calcium hypochlorite, hydrated mixture, corrosive, with not less than 5.5% but not more than 16% water

9 Lead and its compounds

0129 Lead azide, wetted with not less than 20% water, or mixture of alcohol and water, by mass
0130 Lead styphnate, wetted with not less than 20% water, or mixture of alcohol and water, by mass
0130 Lead trinitroresorcinate, wetted with not less than 20% water, or mixture of alcohol and water, by mass

1469 Lead nitrate
1470 Lead perchlorate, solid
1616 Lead acetate
1617 Lead arsenates
1618 Lead arsenites
1620 Lead cyanide
1649 Motor fuel anti-knock mixture
1794 Lead sulphate with more than 3% free acid
1872 Lead dioxide
2291 Lead compound, soluble, n.o.s.
2989 Lead phosphide, dibasic
3408 Lead perchlorate solution
3483 Motor fuel anti-knock mixture, flammable

10 Liquid halogenated hydrocarbons

1099 Allyl bromide
1100 Allyl chloride
1107 Amyl chloride
1126 1-Bromobutane
1127 Chlorobutanes
1134 Chlorobenzene
1150 1,2-Dichloroethylene
1152 Dichloropentanes
1184 Ethylene dichloride
1278 1-Chloropropane
1279 1,2-Dichloropropane
1303 Vinylidene chloride, stabilized
1591 *o*-Dichlorobenzene
1593 Dichloromethane
1605 Ethylene dibromide
1647 Methyl bromide and ethylene dibromide mixture, liquid
1669 Pentachloroethane
1701 Xylyl bromide
1702 1,1,2,2-Tetrachloroethane
1710 Trichloroethylene
1723 Allyl iodide
1737 Benzyl bromide
1738 Benzyl chloride
1846 Carbon tetrachloride
1887 Bromochloromethane
1888 Chloroform
1891 Ethyl bromide
1897 Tetrachloroethylene
1991 Chloroprene, stabilized
2234 Chlorobenzotrifluorides
2238 Chlorotoluenes
2279 Hexachlorobutadiene
2321 Trichlorobenzenes, liquid
2322 Trichlorobutene
2339 2-Bromobutane
2341 1-Bromo-3-methylbutane

2342 Bromomethylpropanes
2343 2-Bromopentane
2344 Bromopropanes
2356 2-Chloropropane
2362 1,1-Dichloroethane
2387 Fluorobenzene
2388 Fluorotoluenes
2390 2-Iodobutane
2391 Iodomethylpropanes
2392 Iodopropanes
2456 2-Chloropropene
2504 Tetrabromoethane
2515 Bromoform
2554 Methylallyl chloride
2644 Methyl iodide
2646 Hexachlorocyclopentadiene
2664 Dibromomethane
2688 1-Bromo-3-chloropropane
2831 1,1,1-Trichloroethane
2872 Dibromochloropropanes

11 Mercury and mercury compounds

0135 Mercury fulminate, wetted with not less than 20% water
1389 Alkali metal amalgam, liquid
1392 Alkaline earth metal amalgam, liquid
1623 Mercuric arsenate
1624 Mercuric chloride
1625 Mercuric nitrate
1626 Mercuric potassium cyanide
1627 Mercurous nitrate
1629 Mercury acetate
1630 Mercury ammonium chloride
1631 Mercury benzoate
1634 Mercury bromides
1636 Mercury cyanide
1637 Mercury gluconate
1638 Mercury iodide
1639 Mercury nucleate
1640 Mercury oleate
1641 Mercury oxide
1642 Mercury oxycyanide, desensitized
1643 Mercury potassium iodide
1644 Mercury salicylate
1645 Mercury sulphate
1646 Mercury thiocyanate
1894 Phenylmercuric hydroxide
1895 Phenylmercuric nitrate
2024 Mercury compound, liquid, n.o.s.
2025 Mercury compound, solid, n.o.s.
2026 Phenylmercuric compound, n.o.s.
2777 Mercury based pesticide, solid, toxic

2778 Mercury based pesticide, liquid, flammable, toxic
2809 Mercury
3011 Mercury based pesticide, liquid, toxic, flammable
3012 Mercury based pesticide, liquid, toxic
3401 Alkali metal amalgam, solid
3402 Alkaline earth metal amalgam, solid

12 Nitrites and their mixtures

1487 Potassium nitrate and sodium nitrite mixture
1488 Potassium nitrite
1500 Sodium nitrite
1512 Zinc ammonium nitrite
2627 Nitrites, inorganic, n.o.s.
2726 Nickel nitrite
3219 Nitrites, inorganic, aqueous solution, n.o.s

13 Perchlorates

1442 Ammonium perchlorate
1447 Barium perchlorate, solid
1455 Calcium perchlorate
1470 Lead perchlorate, solid
1475 Magnesium perchlorate
1481 Perchlorates, inorganic, n.o.s.
1489 Potassium perchlorate
1502 Sodium perchlorate
1508 Strontium perchlorate
3211 Perchlorates, inorganic, aqueous solution, n.o.s.
3406 Barium perchlorate solution
3408 Lead perchlorate solution

14 Permanganates

1448 Barium permanganate
1456 Calcium permanganate
1482 Permanganates, inorganic, n.o.s.
1490 Potassium permanganate
1503 Sodium permanganate
1515 Zinc permanganate
3214 Permanganates, inorganic, aqueous solution, n.o.s.

15 Powdered metals

1309 Aluminium powder, coated
1326 Hafnium powder, wetted with not less than 25% water
1352 Titanium powder, wetted with not less than 25% water
1358 Zirconium powder, wetted with not less than 25% water
1383 Pyrophoric alloy or pyrophoric metal, n.o.s.
1396 Aluminium powder, uncoated
1398 Aluminium silicon powder, uncoated
1418 Magnesium powder
1435 Zinc ashes
1436 Zinc dust or zinc powder
1854 Barium alloys, pyrophoric
2008 Zirconium powder, dry
2009 Zirconium, dry, sheets, strip or coiled wire
2545 Hafnium powder, dry

2546 Titanium powder, dry
2878 Titanium sponge powders
2881 Metal catalyst, dry
2950 Magnesium granules, coated, particle size not less than 149 microns
3078 Cerium, turnings or gritty powder
3089 Metal powder, flammable, n.o.s.
3170 Aluminium smelting by-products
3189 Metal powder, self-heating, n.o.s.

16 Peroxides

1449 Barium peroxide
1457 Calcium peroxide
1472 Lithium peroxide
1476 Magnesium peroxide
1483 Peroxides, inorganic, n.o.s.
1491 Potassium peroxide
1504 Sodium peroxide
1509 Strontium peroxide
1516 Zinc peroxide
2014 Hydrogen peroxide, aqueous solution, 20–60%
2015 Hydrogen peroxide, aqueous solution, stabilized
2466 Potassium superoxide
2547 Sodium superoxide
3149 Hydrogen peroxide and peroxyacetic acid mixture
3377 Sodium perborate monohydrate
3378 Sodium carbonate peroxyhydrate

17 Azides

0129 Lead azide, wetted
0224 Barium azide, dry
1571 Barium azide, wetted
1687 Sodium azide

18 Alkalis

1005 Ammonia, anhydrous
1160 Dimethylamine, aqueous solution
1163 Dimethylhydrazine, unsymmetrical
1235 Methylamine, aqueous solution
1244 Methylhydrazine
1382 Potassium sulphide, anhydrous or potassium sulphide with less than 30% water of crystallization
1385 Sodium sulphide, anhydrous or sodium sulphide with less than 30% water of crystallization
1604 Ethylenediamine
1719 Caustic alkali liquid, n.o.s.
1813 Potassium hydroxide, solid
1814 Potassium hydroxide solution
1819 Sodium aluminate solution
1823 Sodium hydroxide, solid
1824 Sodium hydroxide solution
1825 Sodium monoxide
1835 Tetramethylammonium hydroxide solution
1847 Potassium sulphide, hydrated with not less than 30% water of crystallization
1849 Sodium sulphide, hydrated with not less than 30% water
1907 Soda lime with more than 4% sodium hydroxide

1922 Pyrrolidine
2029 Hydrazine, anhydrous
2030 Hydrazine, aqueous solution with more than 37% hydrazine, by mass
2033 Potassium monoxide
2073 Ammonia solution relative density less than 0.880 at 15°C in water, with more than 35% but not more than 50% ammonia
2079 Diethylenetriamine
2259 Triethylenetetramine
2270 Ethylamine, aqueous solution, with not less than 50% but not more than 70% ethylamine
2318 Sodium hydrosulphide with less than 25% water of crystallization
2320 Tetraethylenepentamine
2379 1,3-Dimethylbutylamine
2382 Dimethylhydrazine, symmetrical
2386 1-Ethylpiperidine
2399 1-Methylpiperidine
2401 Piperidine
2491 Ethanolamine or ethanolamine solution
2579 Piperazine
2671 Aminopyridines
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, by mass
2677 Rubidium hydroxide solution
2678 Rubidium hydroxide, solid
2679 Lithium hydroxide solution
2680 Lithium hydroxide
2681 Caesium hydroxide solution
2682 Caesium hydroxide
2683 Ammonium sulphide solution
2733 Amines, flammable, corrosive, n.o.s. or polyamines, flammable, corrosive, n.o.s.
2734 Amines, liquid, corrosive, flammable, n.o.s. or polyamines, liquid, corrosive, flammable, n.o.s.
2735 Amines, liquid, corrosive, n.o.s. or polyamines, liquid, corrosive, n.o.s.
2795 Batteries, wet, filled with alkali electric storage
2797 Battery fluid, alkali
2818 Ammonium polysulphide solution
2949 Sodium hydrosulphide, solid with not less than 25% water of crystallization
3028 Batteries, dry, containing potassium hydroxide, solid electric storage
3073 Vinylpyridines, stabilized
3253 Disodium trioxosilicate
3259 Amines, solid, corrosive, n.o.s. or polyamines, solid, corrosive, n.o.s.
3262 Corrosive solid, basic, inorganic, n.o.s.
3263 Corrosive solid, basic, organic, n.o.s.
3266 Corrosive liquid, basic, inorganic, n.o.s.
3267 Corrosive liquid, basic, organic, n.o.s.
3293 Hydrazine, aqueous solution with not more than 37% hydrazine, by mass
3318 Ammonia solution relative density less than 0.880 at 15°C in water, with more than 50% ammonia
3320 Sodium borohydride and sodium hydroxide solution with not more than 12% sodium borohydride and not more than 40% sodium hydroxide, by mass
3423 Tetramethylammonium hydroxide, solid
3484 Hydrazine aqueous solution, flammable, with more than 37% hydrazine, by mass

Chapter 3.2

Dangerous Goods List

3.2.1 Structure of the Dangerous Goods List

The Dangerous Goods List is divided into 18 columns as follows:

Column 1 **UN No.** – this column contains the United Nations Number assigned to a dangerous good by the United Nations Sub-Committee of Experts on the Transport of Dangerous Goods (UN List).

Column 2 **Proper Shipping Name (PSN)** – this column contains the Proper Shipping Names in upper-case characters, which may have to be followed by additional descriptive text in lower-case characters (see 3.1.2). Proper Shipping Names may be shown in plural where isomers of similar classification exist. Hydrates may be included under the Proper Shipping Name for the anhydrous substances. Unless otherwise indicated for an entry in the Dangerous Goods List, the word "SOLUTION" in a Proper Shipping Name means one or more named dangerous goods dissolved in a liquid that is not otherwise subject to this Code. When a flashpoint is mentioned in this column, the data is based on closed-cup (c.c.) methods.

Column 3 **Class or division** – this column contains the class and, in the case of class 1, the division and the compatibility group assigned to the substance or article according to the classification system described in part 2, chapter 2.1.

Column 4 **Subsidiary risk(s)** – this column contains the class number(s) of any subsidiary risk(s) which have been identified by applying the classification system described in part 2. This column also identifies a dangerous good as a marine pollutant as follows:

P – Marine pollutant: a non-exhaustive list of known marine pollutants, based on previous criteria and assignment

Column 5 **Packing group** – this column contains the packing group number (i.e., I, II or III) where assigned to the substance or article. If more than one packing group is indicated for the entry, the packing group of the substance or formulation to be transported shall be determined, based on its properties, through application of the hazard grouping criteria as provided in part 2.

Column 6 **Special provisions** – this column contains a number referring to any special provision(s) indicated in chapter 3.3 that is relevant to the substance or article. Special provisions apply to all packing groups permitted for a particular substance or article unless the wording makes it otherwise apparent. The special provision numbers specific to the sea mode start from 900.

Note: When a special provision is no longer needed, this special provision is deleted but the special provision number is not allocated again, in order not to confuse the users of this Code. For this reason, some of the numbers are missing.

Column 7a **Limited quantities:** this column provides the maximum quantity per inner packaging or article for transporting dangerous goods as limited quantities in accordance with chapter 3.4.

Column 7b **Excepted quantities:** this column provides an alpha-numeric code described in sub-section 3.5.1.2 which indicates the maximum quantity per inner and outer packaging for transporting dangerous goods as excepted quantities in accordance with chapter 3.5.

Column 8 **Packing instructions** – this column contains alpha-numeric codes which refer to the relevant packing instruction(s) in 4.1.4. The packing instructions indicate the packagings (including large packagings) which may be used for the transport of substances and articles.

A code including the letter "P" refers to packing instructions for the use of packagings described in chapter 6.1, 6.2 or 6.3.

A code including the letters "LP" refers to packing instructions for the use of large packagings described in chapter 6.6.

When a code including the letter(s) "P" or "LP" is not provided, it means that the substance is not allowed in that type of packaging.

Column 9 **Special packing provisions** – this column contains alpha-numeric codes which refer to the relevant special packing provisions specified in 4.1.4. The special packing provisions indicate the packagings (including large packagings).

A special packing provision including the letters "PP" refers to a special packing provision applicable to the use of a packing instruction bearing the Code "P" in 4.1.4.1.

A special packing provision including the letter "L" refers to a special packing provision applicable to a packing instruction bearing the code "LP" in 4.1.4.3.

Column 10 **IBC packing instructions** – this column contains alpha-numeric codes that refer to the relevant IBC instruction, which indicates the type of IBC that shall be used for the transport of the substance under reference. A code including the letters "IBC" refers to packing instructions for the use of IBCs described in chapter 6.5. When a code is not provided, it means the substance is not authorized in IBC.

Column 11 **IBC special provisions** – this column contains an alpha-numeric code, including the letter "B", which refers to special packing provisions applicable to the use of packing instructions bearing the code "IBC" in 4.1.4.2.

Column 12 [Reserved]

Column 13 **Tank and bulk container instructions** – this column contains T codes (see 4.2.5.2.6) applicable to the transport of dangerous goods in portable tanks and road tank vehicles.

When a T code is not provided in this column, it means that the dangerous goods are not authorized for transport in tanks unless specifically approved by the competent authority.

A code including the letters BK refers to type of bulk containers used for the transport of bulk goods described in chapter 4.3 and chapter 6.9.

The gases authorized for transport in MEGCs are indicated in the column "MEGC" in Tables 1 and 2 of packing instruction P200 in 4.1.4.1.

Column 14 **Tank special provisions** – this column contains TP notes (see 4.2.5.3) applicable to the transport of dangerous goods in portable tanks and road tank vehicles. The TP notes specified in this column apply to the portable tanks specified in both columns 12 and 13.

Column 15 **EmS** – this column refers to the relevant emergency schedules for FIRE and SPILLAGE in "The EmS Guide – Emergency Response Procedures for Ships Carrying Dangerous Goods".

The first EmS code refers to the relevant Fire Schedule (e.g., Fire Schedule Alfa "F-A" General Fire Schedule).

The second EmS code refers to the relevant Spillage Schedule (e.g., Spillage Schedule Alfa "S-A" Toxic Substances).

Underlined EmS codes (special cases) indicate a substance, material or article for which additional advice is given in the emergency response procedures.

For dangerous goods offered for transport under N.O.S. entries or other generic entries, the most relevant emergency response procedures may vary with the properties of the hazardous constituents. As a consequence, shippers may have to declare different EmS codes from those indicated, if, to their knowledge, such codes are more appropriate.

The provisions in this column are not mandatory.

Column 16 **Stowage and segregation** – this column contains the stowage and segregation provisions as prescribed in part 7.

Column 17 **Properties and observations** – this column contains properties of and observations on the dangerous goods listed. The provisions in this column are not mandatory.

Properties of most gases include an indication of its density in relation to air. The figures in brackets give the density relative to air.

.1 "lighter than air" when the vapour density is down to half that of air;

.2 "much lighter than air" when the vapour density is less than half that of air;

.3 "heavier than air" when the vapour density is up to twice that of air; and

.4 "much heavier than air" when the vapour density is more than twice that of air.

When explosive limits are given, these refer to the volume percentage of the vapour of the substance when mixed with air.

The ease and extent to which different liquids mix with water varies greatly and most entries have included an indication of miscibility. In these cases “miscible with water” normally means capable of being mixed with water in all proportions to form a completely homogeneous liquid.

Column 18 **UN No.** – see column 1.

3.2.2 Abbreviations and symbols

The following abbreviations and symbols are used in the Dangerous Goods List and have the meanings shown:

Abbreviation/symbol	Column	Meaning
N.O.S.	2	Not otherwise specified
P	4	Marine pollutant

Chapter 3.3

Special provisions applicable to certain substances, materials or articles

3.3.1 When column 6 of the Dangerous Goods List indicates that a special provision is relevant to a dangerous good, the meaning and requirement(s) of that special provision are as set out below:

16 Samples of new or existing explosive substances or articles may be transported as directed by the competent authority for purposes including: testing, classification, research and development, quality control, or as a commercial sample. Explosive samples which are not wetted or desensitized shall be limited to 10 kg in small packages as specified by the competent authority. Explosive samples which are wetted or desensitized 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.

26 This substance is not permitted for transport in portable tanks, or intermediate bulk containers with a capacity exceeding 450 ℓ, due to the potential initiation of an explosion when transported in large volumes.

28 This substance may be transported under the provisions of class 4.1 only if it is so packaged that the percentage of diluent will not fall below that stated, at any time during transport (see 2.4.2.4).

29 The packages, including bales, are exempt from labelling provided that they are marked with the appropriate class (e.g., “class 4.2”). Packages, with the exception of bales, shall also display the Proper Shipping Name and the UN Number of the substance that they contain in accordance with 5.2.1. In any case, the packages, including bales, are exempt from class marking provided that they are loaded in a cargo transport unit and that they contain goods to which only one UN Number has been assigned. The cargo transport units in which the packages, including bales, are loaded shall display any relevant labels, placards and marks in accordance with chapter 5.3.

32 When in any other form, this substance is not subject to the provisions of this Code.

37 When coated, this substance is not subject to the provisions of this Code.

38 This substance, when it contains not more than 0.1% calcium carbide, is not subject to the provisions of this Code.

39 This substance, when it contains less than 30% or not less than 90% silicon, is not subject to the provisions of this Code.

43 When offered for transport as pesticides, these substances shall be transported under the relevant pesticide entry and in accordance with the relevant pesticide provisions (see 2.6.2.3 and 2.6.2.4).

45 Antimony sulphides and oxides which contain not more than 0.5% of arsenic, calculated on the total mass, are not subject to the provisions of this Code.

47 Ferricyanides and ferrocyanides are not subject to the provisions of this Code.

59 These substances, when they contain not more than 50% magnesium, are not subject to the provisions of this Code.

61 The technical name, which shall supplement the Proper Shipping Name, shall be the ISO common name, or 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 3.1.2.8.1.1).

62 This substance, when it contains not more than 4% sodium hydroxide, is not subject to the provisions of this Code.

63 The division of class 2 and the subsidiary risks depend on the nature of the contents of the aerosol dispenser. The following provisions shall apply:

.1 Class 2.1 applies if the contents include 85% by mass or more flammable components and the chemical heat of combustion is 30 kJ/g or more;

.2 Class 2.2 applies if the contents contain 1% by mass or less flammable components and the heat of combustion is less than 20 kJ/g.

.3 Otherwise the product shall be classified as tested by the tests described in the United Nations *Manual of Tests and Criteria*, Part III, section 31. Extremely flammable and flammable aerosols shall be classified in class 2.1; non-flammable in class 2.2;

.4 Gases of class 2.3 shall not be used as a propellant in an aerosol dispenser;

.5 Where the contents other than the propellant of aerosol dispensers to be ejected are classified as class 6.1 packing groups II or III or class 8 packing groups II or III, the aerosol shall have a subsidiary risk of class 6.1 or class 8;

.6 Aerosols with contents meeting the criteria for packing group I for toxicity or corrosivity shall be prohibited from transport;

.7 Except for consignments transported in limited quantities (see chapter 3.4), packages containing aerosols shall bear labels for the primary risk and for the subsidiary risk(s), if any.

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 United Nations *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.

65 Hydrogen peroxide aqueous solutions with less than 8% hydrogen peroxide are not subject to the provisions of this Code.

66 Mercurous chloride shall be transported under UN 3077 and cinnabar is not subject to the provisions of this Code.

76 The transport of this substance shall be prohibited except with special authorization granted by the competent authority of the country concerned.

105 Nitrocellulose meeting the descriptions of UN 2556 or UN 2557 may be classified in class 4.1.

113 The transport of chemically unstable mixtures is prohibited.

117 Only regulated when transported by sea.

119 Refrigerating machines and refrigerating machinery components including 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 this Code if they contain less than 12 kg of gas in class 2.2 or less than 12 ℓ of ammonia solution (UN 2672).

122 The subsidiary risk(s), the control and emergency temperatures, if any, and the generic entry number for each of the currently assigned organic peroxide formulations are given in 2.5.3.2.4.

127 Other inert material or inert material mixture may be used at the discretion of the competent authority, provided this inert material has identical phlegmatizing properties.

131 The phlegmatized substance shall be significantly less sensitive than dry PETN.

133 If over-confined in packagings, this substance may exhibit explosive behaviour. Packagings authorized under packing instruction P409 are intended to prevent over-confinement. When a packaging other than those prescribed under packing instruction P409 is authorized by the competent authority of the country of origin in accordance with 4.1.3.7, the package shall bear an "EXPLOSIVE" subsidiary risk label (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 5.4.1.5.5.1). The provisions of 7.2.3.3, 7.1.3.1 and 7.1.4.4 shall also be considered.

135 The dihydrated sodium salt of dichloroisocyanuric acid is not subject to the provisions of this Code.

138 *p*-Bromobenzyl cyanide is not subject to the provisions of this Code.

141 Products which have undergone sufficient heat treatment so that they present no hazard during transport are not subject to the provisions of this Code.

142 Solvent-extracted soya bean meal containing not more than 1.5% oil and 11% moisture, being substantially free from flammable solvents, which is accompanied by a certificate from the shipper stating that the substance, as offered for shipment, meets this requirement is not subject to the provisions of this Code.

144 An aqueous solution containing not more than 24% alcohol by volume is not subject to the provisions of this Code.

145 Alcoholic beverages of packing group III, when transported in receptacles of 250 ℓ or less, are not subject to the provisions of this Code.

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 as required by 2.1.3.

153 This entry applies only if it is demonstrated, on the basis of tests, that the substance, when in contact with water, is not combustible nor shows a tendency to auto-ignition and that the mixture of gases evolved is not flammable.

163 A substance specifically listed by name in the Dangerous Goods List shall not be transported under this entry. Materials transported 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 transport is not subject to the provisions of this Code. Manufactured articles containing asbestos and not meeting this provision are nevertheless not subject to the provisions of this Code when packaged so that no escape of hazardous quantities of respirable asbestos fibres can occur during transport.

169 Phthalic anhydride in the solid state and tetrahydrophthalic anhydride, with not more than 0.05% maleic anhydride, are not subject to the provisions of this Code. Phthalic anhydride molten at a temperature above its flashpoint, with not more than 0.05% maleic anhydride, shall be classified under UN 3256.

172 Radioactive material with a subsidiary risk shall:

.1 be labelled with subsidiary risk labels corresponding to each subsidiary risk exhibited by the material; corresponding placard shall be affixed to transport units in accordance with the relevant provisions of 5.3.1;

.2 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 5.4.1.5.7.1.2 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. For packing, see also 4.1.9.1.5.

For thorium nitrate solid and uranium nitrate solid, the subsidiary risk is 5.1. For uranyl nitrate hexahydrate solution and uranium hexafluoride, the subsidiary risk is 8. For pyrophoric uranium metal and pyrophoric thorium metal, the subsidiary risk is 4.2.

177 Barium sulphate is not subject to the provisions of this Code.

178 This entry shall be used only when no other appropriate entry exists in the list, and only with the approval of the competent authority of the country of origin.

181 Packages containing this type of substance shall bear the "EXPLOSIVE" subsidiary risk label (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 5.4.1.5.5.1). The provisions of 7.2.3.3 shall also be considered.

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 transport are not subject to other provisions of this Code if they meet the following:

.1 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 W h;

.2 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 W h. 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;

.3 Each cell or battery meets the provisions of 2.9.4.1 and 2.9.4.5;

.4 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.

.5 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. This requirement does not apply to devices which are intentionally active in transport (radio frequency identification (RFID) transmitters, watches, sensors, etc.) and which are not capable of generating a dangerous evolution of heat. 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.

.6 Except for packages containing button cell batteries installed in equipment (including circuit boards), or 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.

.7 Each consignment of one or more packages marked in accordance with paragraph .6 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.

.8 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

.9 Except when batteries are installed in or packed with equipment, packages shall not exceed 30 kg gross mass.

As used above and elsewhere in this Code, "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 transport of these batteries for specific modes of transport 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 provisions of this Code.

191 Receptacles with a capacity not exceeding 50 mℓ containing only non-toxic constituents are not subject to the provisions of this Code.

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 provisions of this Code when shown by a Trough Test (see United Nations *Manual of Tests and Criteria*, Part III, sub-section 38.2) that they are not liable to self-sustaining decomposition.

194 The control and emergency temperatures, if any, and the generic entry number for each of the currently assigned self-reactive substances are given in 2.4.2.3.2.3.

195 For certain organic peroxides types B or C, a smaller packaging than that allowed by packing methods OP5 or OP6 respectively has to be used (see 4.1.7 and 2.5.3.2.4).

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 transported 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 transported under the provisions of class 5.2 (see 2.5.3.2.4).

198 Nitrocellulose solutions containing not more than 20% nitrocellulose may be transported as paint, perfumery products or printing ink, as applicable. See UN Nos. 1210, 1263, 1266, 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 provisions of this Code unless they meet the criteria for inclusion in another hazard 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 transport. 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.

203 This entry shall not be used for polychlorinated biphenyls, UN 2315.

204 Articles containing smoke-producing substance(s) corrosive according to the criteria for class 8 shall be labelled with a "CORROSIVE" subsidiary risk label (Model No. 8, see 5.2.2.2.2).

205 This entry shall not be used for PENTACHLOROPHENOL, UN 3155.

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 provisions of this Code.

209 The gas shall be at a pressure corresponding to ambient atmospheric pressure at the time the containment system is closed and this shall not exceed 105 kPa absolute.

210 Toxins from plant, animal or bacterial sources which contain infectious substances, or toxins that are contained in infectious substances, shall be classified under 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 2.4.2.3.2.3). Homogeneous mixtures containing not more than 35% by mass of azodicarbonamide and at least 65% of inert substance are not subject to this Code unless criteria of other classes are met.

216 Mixtures of solids which are not subject to the provisions of this Code and flammable liquids may be transported 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 or cargo transport unit is closed. Each cargo transport unit shall be leakproof when used as a bulk container. 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 the provisions of this Code provided there is no free liquid in the packet or article.

217 This entry shall only be used for mixtures of solids which are not subject to the provisions of this Code and toxic liquids may be transported 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 or cargo transport unit is closed. Each cargo transport unit shall be leakproof when used as a bulk container. This entry shall not be used for solids containing a packing group I liquid.

218 This entry shall only be used for mixtures of solids which are not subject to the provisions of this Code and corrosive liquids may be transported 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 or cargo transport unit is closed. Each cargo transport unit shall be leakproof when used as a bulk container. This entry shall not be used for solids containing a packing group I liquid.

219 Genetically modified microorganisms (GMMOs) and genetically modified organisms (GMOs) packed and marked in accordance with packing instruction P904 are not subject to any other provisions of this Code.

If GMMOs or GMOs meet the definition in chapter 2.6 of a toxic substance or an infectious substance and the criteria for inclusion in class 6.1 or 6.2, the provisions of this Code for transporting toxic substances or infectious substances apply.

220 The technical name of the flammable liquid component only 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.

223 If the chemical or physical properties of a substance covered by this description are such that, when tested, it does not meet the established defining criteria for the class or division listed in column 3, or any other class or division, it is not subject to the provisions of this Code except in the case of a marine pollutant where 2.10.3 applies.

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 division 1.4C or 1.4S) without changing the classification of class 2.2 provided the total quantity of deflagrating (propellant) explosives does not exceed 3.2 g per extinguishing unit.

226 Formulations of these substances containing not less than 30% non-volatile, non-flammable phlegmatizer are not subject to the provisions of this Code.

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 United Nations *Manual of Tests and Criteria*, Part I.

228 Mixtures not meeting the criteria for flammable gases (class 2.1) shall be transported under UN 3163.

230 Lithium cells and batteries may be transported under this entry if they meet the provisions of 2.9.4.

232 This entry shall only be used when the substance does not meet the criteria of any other class. Transport in cargo transport units other than in tanks shall be in accordance with standards specified by the competent authority of the country of origin.

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 and the excepted quantity code shown in columns 7a and 7b of the Dangerous Goods List apply to the base material.

237 The membrane filters, including paper separators, coating or backing materials, etc., that are present in transport, shall not be liable to propagate a detonation as tested by one of the tests described in the United Nations *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 United Nations *Manual of Tests and Criteria*, Part III, 33.2.1, that nitrocellulose membrane filters in the form in which they are to be transported are not subject to the provisions of this Code applicable to flammable solids in class 4.1.

238 .1 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°C ± 4°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.

Non-spillable type batteries which are an integral part of and necessary for the operation of mechanical or electronic equipment shall be securely fastened in the battery holder on the equipment and protected in such a manner as to prevent damage and short circuits.

.2 Non-spillable batteries are not subject to the provisions of this Code 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, when packaged for transport, the terminals are protected from short circuit.

239 Batteries or cells shall not contain dangerous goods other than sodium, sulphur or sodium compounds (e.g., sodium polysulphides and sodium tetrachloroaluminate). Batteries or cells shall not be offered for transport 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.

Cells shall consist of hermetically sealed metal casings which fully enclose the dangerous goods and which are so constructed and closed as to prevent the release of the dangerous goods under normal conditions of transport.

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 goods under normal conditions of transport.

Batteries installed in vehicles are not subject to the provisions of this Code.

240 This entry only applies to vehicles powered by wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries and equipment powered by wet batteries or sodium batteries transported with these batteries installed.

For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are electrically-powered cars, motorcycles, scooters, three- and four-wheeled vehicles or motorcycles, e bikes, wheel-chairs, lawn tractors, boats and aircraft.

Examples of equipment are lawnmowers, cleaning machines or model boats and model aircraft. Equipment powered by lithium metal batteries or lithium ion batteries shall be consigned under the entries UN 3091 LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT or UN 3091 LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT or UN 3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or UN 3481 LITHIUM ION BATTERIES PACKED WITH EQUIPMENT, as appropriate.

Hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the battery(ies) installed shall be consigned under the entries UN 3166 VEHICLE, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FLAMMABLE LIQUID POWERED, as appropriate. Vehicles which contain a fuel cell shall be consigned under the entries UN 3166 VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED, as appropriate.

241 The formulation shall be prepared so that it remains homogeneous and does not separate during transport. 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 United Nations *Manual of Tests and Criteria*, Part I and not being a flammable solid when tested in accordance with test No. 1 in the United Nations *Manual of Tests and Criteria*, Part III, paragraph 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 provisions of this Code.

242 Sulphur is not subject to the provisions of this Code when it has been formed to a specific shape (such as 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 materials and substances such as 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 transported as part of the manufacturing process, may be transported 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, as appropriate, on the following conditions:

.1 the wooden barrels shall be checked and tightened before filling;

.2 sufficient ullage (not less than 3%) shall be left to allow for the expansion of the liquid;

.3 the wooden barrels shall be transported with the bungholes pointing upwards;

.4 the wooden barrels shall be transported in containers meeting the provisions of the International Convention for Safe Containers (CSC 1972), as amended, and 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 transport; and

.5 when carried on board ships, the containers shall be stowed in open cargo spaces or in enclosed cargo spaces complying with the requirements for class 3 flammable liquids with a flashpoint of 23°C c.c. or less in regulation II-2/19 of SOLAS, 74, as amended or regulation II-2/54 of SOLAS 74, as amended by the resolutions indicated in II-2/1.2.1, as applicable.

249 Ferrocerium, stabilized against corrosion, with a minimum iron content of 10% is not subject to the provisions of this Code.

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 transport of substances under this entry shall be in accordance with the chain of custody and security procedures specified by the Organization for the Prohibition of Chemical Weapons.

The chemical sample may only be transported provided prior approval has been granted by the competent authority or the Director General of the Organization for the Prohibition of Chemical Weapons and providing the sample complies with the following conditions:

.1 it shall be packaged according to packing instruction 623 in the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air; and

.2 during transport, it shall be accompanied by a copy of the document of approval for transport, showing the quantity limitations and the packing provisions.

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, testing or repair purposes. Such kits may not contain dangerous goods for which the quantity "0" has been indicated in column 7a of the Dangerous Goods List.

Components shall not react dangerously (see 4.1.1.6). 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 vehicles for first-aid or operating purposes are not subject to the provisions of this Code.

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 the Dangerous Goods List may be transported in accordance with chapter 3.4.

252 Provided the ammonium nitrate remains in solution under all conditions of transport, aqueous solutions of ammonium nitrate, with not more than 0.2% combustible material, in a concentration not exceeding 80%, are not subject to the provisions of this Code.

266 This substance, when containing less alcohol, water or phlegmatizer than specified, shall not be transported, unless specifically authorized by the competent authority.

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 in transport 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 under class 4.1 on the basis of series 6(c) tests of Part I of the United Nations *Manual of Tests and Criteria* on at least three packages as prepared for transport. Mixtures containing at least 98%, by mass, of phlegmatizer are not subject to the provisions of this Code. Packages containing mixtures with not less than 90%, by mass, of phlegmatizer need not bear a "TOXIC" subsidiary risk label.

272 This substance shall not be transported under the provisions of class 4.1 unless specifically authorized by the competent authority (see UN 0143 or UN 0150 as appropriate).

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 m^3 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 $\pm$ 2°C for a period of 24 hours.

274 For the purposes of documentation and package marking, the Proper Shipping Name shall be supplemented with the technical name (see 3.1.2.8.1).

277 For aerosols or receptacles containing toxic substances, the limited quantity value is 120 mℓ. For all other aerosols or receptacles, the limited quantity value is 1000 mℓ.

278 These substances shall not be classified and transported unless authorized by the competent authority on the basis of results from series 2 tests and series 6(c) tests of Part I of the United Nations *Manual of Tests and Criteria* on packages as prepared for transport (see 2.1.3.1). The competent authority shall assign the packing group on the basis of the chapter 2.3 criteria and the package type used for the series 6(c) tests.

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 this Code.

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 transported as component parts and when these articles as presented for transport have been tested in accordance with Test series 6(c) of Part I of the United Nations *Manual of Tests and Criteria*, with no explosion of the device, no fragmentation of device casing or pressure receptacle, and no projection hazard nor thermal effect which would significantly hinder fire-fighting or other emergency response efforts in the immediate vicinity.

281 Transport of hay, straw or bhusa when wet, damp or contaminated with oil is prohibited and when not wet or contaminated with oil is subject to the provisions of this Code.

283 Articles, containing gas, intended to function as shock absorbers, including impact-energy-absorbing devices or pneumatic springs, are not subject to the provisions of this Code provided:

.1 each article has a gas space capacity not exceeding 1.6 ℓ and a charge pressure not exceeding 280 bar where the product of the capacity (litres) and charge pressure (bar) does not exceed 80 (i.e., 0.5 ℓ gas space and 160 bar charge pressure, 1 ℓ gas space and 80 bar charge pressure, 1.6 ℓ gas space and 50 bar charge pressure, 0.28 ℓ gas space and 280 bar charge pressure);

.2 each article has a minimum burst pressure of 4 times the charge pressure at 20°C for products not exceeding 0.5 ℓ gas space capacity and 5 times charge pressure for products greater than 0.5 ℓ gas space capacity;

.3 each article is manufactured from material which will not fragment upon rupture;

.4 each article is manufactured in accordance with a quality-assurance standard acceptable to the competent authority; and

.5 the design type has been subjected to a fire test demonstrating that pressure in the article is relieved 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.

284 An oxygen generator, chemical, containing oxidizing substances shall meet the following conditions:

.1 the generator, when containing an explosive device, shall only be transported under this entry when excluded from class 1 in accordance with 2.1.3 of this Code;

.2 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; and

.3 when the 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 provisions of this Code when contained individually in an article or a sealed packet.

288 These substances shall not be classified and transported unless authorized by the competent authority on the basis of results from series 2 tests and series 6(c) tests of Part I of the United Nations *Manual of Tests and Criteria* on packages as prepared for transport (see 2.1.3).

289 Air bag inflators, air bag modules or seat-belt pretensioners installed in vehicles, vessels or aircrafts or in completed components such as steering columns, door panels, seats, etc. are not subject to the provisions of this Code.

290 When this radioactive material meets the definitions and criteria of other classes or divisions as defined in part 2, it shall be classified in accordance with the following:

.1 Where the substance meets the criteria for dangerous goods in excepted quantities as set out in chapter 3.5, the packagings shall be in accordance with 3.5.2 and meet the testing requirements of 3.5.3. All other requirements applicable to radioactive material, excepted packages as set out in 1.5.1.5 shall apply without reference to the other class or division;

.2 Where the quantity exceeds the limits specified in 3.5.1.2, the substance shall be classified in accordance with the predominant subsidiary risk. The dangerous goods transport document shall describe the substance with the UN Number and Proper Shipping Name applicable to the other class supplemented with the name applicable to the radioactive excepted package according to column 2 in the Dangerous Goods List of chapter 3.2, and the substance shall be transported in accordance with the provisions applicable to that UN Number. An example of the information shown on the dangerous goods transport document is:

UN 1993, Flammable liquid, N.O.S. (ethanol and toluene mixture), Radioactive material, excepted package – limited quantity of material, class 3, PG II.

In addition, the provisions of 2.7.2.4.1 shall apply;

.3 The provisions of chapter 3.4 for the transport of dangerous goods packed in limited quantities shall not apply to substances classified in accordance with subparagraph .2;

.4 When the substance meets a special provision that exempts this substance from all dangerous goods provisions of the other classes, it shall be classified in accordance with the applicable UN Number of class 7 and all requirements specified in 1.5.1.5 shall apply.

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 and refrigerating machinery components 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 transport. Refrigerating machines and refrigerating-machine components are not subject to the provisions of this Code if they contain less than 12 kg of gas.

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 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.

294 Safety matches and wax 'Vesta' matches in an outer packaging not exceeding 25 kg net mass are not subject to any other provision (except marking) of this Code when packaged in accordance with packing instruction P407.

295 Batteries need not be individually marked and labelled if the pallet bears the appropriate mark and label.

296 These entries apply to life-saving appliances such as liferafts, personal flotation devices and self-inflating slides. UN 2990 applies to self-inflating appliances. UN 3072 applies to life-saving appliances that are not self-inflating. Life-saving appliances may contain:

.1 signal devices (class 1) which may include smoke and illumination signal flares packed in packagings that prevent them from being inadvertently activated;

.2 for UN 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;

.3 class 2.2 compressed or liquefied gases;

.4 electric storage batteries (class 8) and lithium batteries (class 9);

.5 first aid kits or repair kits containing small quantities of dangerous goods (e.g., classes 3, 4.1, 5.2, 8 or 9 substances); or

.6 "Strike anywhere" matches packed in packagings that prevent them from being inadvertently activated.

Life-saving appliances packed in strong rigid outer packagings with a total maximum gross mass of 40 kg, containing no dangerous goods other than Class 2.2 compressed or liquefied gases with no subsidiary risk in receptacles with a capacity not exceeding 120 mℓ, installed solely for the purpose of the activation of the appliance, are not subject to the provision of this Code.

299 Consignments of:

(i) Cotton, dry having a density not less than 360 kg/m^3;

(ii) Flax, dry having a density not less than 400 kg/m^3;

(iii) Sisal, dry having a density not less than 360 kg/m^3; and

(iv) Tampico fibre, dry having a density not less than 360 kg/m^3,

according to ISO 8115:1986, are not subject to the provisions of this Code when transported in closed cargo transport units.

300 Fish meal, fish scrap and krill meal shall not be transported if the temperature at the time of loading exceeds 35°C or 5°C above the ambient temperature, whichever is higher.

301 This entry only applies to machinery or apparatus containing dangerous substances as a residue or an integral element of the machinery or apparatus. It shall not be used for machinery or apparatus for which a Proper Shipping Name already exists in the Dangerous Goods List. Machinery and apparatus transported under this entry shall only contain dangerous goods which are authorized to be transported in accordance with the provisions in chapter 3.4 (Limited quantities). The quantity of dangerous goods in machinery or apparatus shall not exceed the quantity specified in column 7a of the Dangerous Goods List for each item of dangerous goods contained. If the machinery or apparatus contains more than one item of dangerous goods, the individual substances shall not be capable

of reacting dangerously with one another (see 4.1.1.6). When it is required to ensure liquid dangerous goods remain in their intended orientation, package orientation labels meeting the specifications of ISO 780: 1985 shall be affixed on at least two opposite vertical sides with the arrows pointing in the correct direction. The transport of dangerous goods in machinery or apparatus where the quantity of dangerous goods exceeds the quantity specified in column 7a of the Dangerous Goods List is authorized when approved by the competent authority, except where special provision 363 applies.

302 Fumigated cargo transport units containing no other dangerous goods are only subject to the provisions of 5.5.2.

303 Receptacles shall be assigned to the class and, if any, subsidiary hazard of the gas or mixture of gases contained therein determined in accordance with the provisions of chapter 2.2.

304 This entry may only be used for the transport of non-activated batteries which contain dry potassium hydroxide and which are intended to be activated prior to use by the addition of an appropriate amount of water to the individual cells.

305 These substances are not subject to the provisions of this Code 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 United Nations *Manual of Tests and Criteria*, Part I).

307 This entry shall be used for uniform mixtures containing ammonium nitrate as the main ingredient within the following composition limits:

.1 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

.2 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

.3 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%.

308 Fish scrap or fish meal shall contain at least 100 ppm of antioxidant (ethoxyquin) at the time of consignment.

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 United Nations *Manual of Tests and Criteria*, Part I, section 18 and be approved by the competent authority.

310 The testing requirements in chapter 38.3 of the United Nations *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 transported for testing, if:

.1 the cells and batteries are transported 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 packagings; and

.2 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 transported under this entry unless approved by the competent authority on the basis of the results of appropriate tests according to Part I of the United Nations *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 transport.

312 Vehicles or machinery powered by a fuel cell engine shall be consigned under the entries UN 3166 VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED, or UN 3166 ENGINE, FUEL CELL, FLAMMABLE GAS POWERED or UN 3166

ENGINE, FUEL CELL, FLAMMABLE LIQUID POWERED as appropriate. These entries include hybrid electric vehicles powered by both a fuel cell and an internal combustion engine with wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the battery(ies) installed.

Other vehicles which contain an internal combustion engine shall be consigned under the entries UN 3166 VEHICLE, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FLAMMABLE LIQUID POWERED, as appropriate. These entries include hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the batteries installed.

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 transport, 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 2.6.2.2.4.3.

316 This entry applies only to calcium hypochlorite, dry, when transported in non-friable tablet form.

317 “Fissile – excepted” applies only to those packages complying with 6.4.11.2.

318 For the purposes of documentation, the Proper Shipping Name shall be supplemented with the technical name (see 3.1.2.8). Technical names need not be shown on the package. When the infectious substances to be transported are unknown, but suspected of meeting the criteria for inclusion in category A and assignment to UN 2814 or UN 2900, the words “suspected category A infectious substance” shall be shown, in parentheses, following the Proper Shipping Name on the transport document, but not on the outer packagings.

319 Substances packed and packages marked in accordance with packing instruction P650 are not subject to any other provisions of this Code.

321 These storage systems shall always be considered as containing hydrogen.

322 When transported in non-friable tablet form, these goods are assigned to packing group III.

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 2978.

326 In the case of fissile uranium hexafluoride, the material shall be classified under UN 2977.

327 Waste aerosols consigned in accordance with 5.4.1.4.3.3 may be transported 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 P207 and special provision PP87, or packing instruction LP02 and special packing provision L2. Leaking or severely deformed aerosols shall be transported in salvage packagings provided appropriate measures are taken to ensure there is no dangerous build-up of pressure. Waste aerosols shall not be transported in closed freight 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 controls 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 transport.

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 m drop test onto an unyielding surface, in the orientation most likely to result in failure of the containment system, with no loss of contents.

When lithium metal or lithium ion batteries are contained in the fuel cell system, the consignment shall be consigned under this entry and under the appropriate entries for UN 3091 LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT or UN 3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT.

332 Magnesium nitrate hexahydrate is not subject to the provisions of this Code.

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 transport.

335 Mixtures of solids which are not subject to the provisions of this Code and environmentally hazardous liquids assigned to UN 3082 may be classified and transported as UN 3077, 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. If free liquid is visible at the time the mixture is loaded or at the time the packaging or cargo transport unit is closed, the mixture shall be classified as UN 3082. Each cargo transport unit shall be leakproof when used as a bulk container. Sealed packets and articles containing less than 10 mℓ of an environmentally hazardous liquid assigned to UN 3082, 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 assigned to UN 3077, are not subject to the provisions of this Code.

338 Each fuel cell cartridge transported under this entry and designed to contain a liquefied flammable gas shall:

.1 be capable of withstanding, without leakage or bursting, a pressure of at least two times the equilibrium pressure of the contents at 55°C;

.2 Not contain more than 200 mℓ liquefied flammable gas, the vapour pressure of which shall not exceed 1 000 kPa at 55 °C; and

.3 pass the hot water bath test prescribed in 6.2.4.1 of chapter 6.2.

339 Fuel cell cartridges containing hydrogen in a metal hydride transported 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 two (2) times 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:

.1 Inspection procedures to be carried out before initial filling and before refilling of the fuel cell cartridge;

.2 Safety precautions and potential hazards to be aware of;

.3 Method for determining when the rated capacity has been achieved;

.4 Minimum and maximum pressure range;

.5 Minimum and maximum temperature range; and

.6 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 transport. 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 m drop test onto an unyielding surface in four different orientations:

.1 Vertically, on the end containing the shut-off valve assembly;

.2 Vertically, on the end opposite to the shut-off valve assembly;

.3 Horizontally, onto a steel apex with a diameter of 38 mm, with the steel apex in the upward position; and

.4 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:

.1 The internal pressure vents to zero gauge pressure without rupture of the cartridge; or

.2 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°C ± 5°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:

.1 The rated charging pressure in megapascals (MPa);

.2 The manufacturer's serial number of the fuel cell cartridges or unique identification number; and

.3 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 the Dangerous Goods List may be transported in accordance with chapter 3.5. Class 5.2 substances, although not individually authorized as excepted quantities in the Dangerous Goods List, are authorized in such kits and are assigned code E2 (see 3.5.1.2).

341 Bulk transport of infectious substances in BK2 bulk containers is only permitted for infectious substances contained in animal material as defined in 1.2.1 (see 4.3.2.4.1).

342 Glass inner receptacles (such as ampoules or capsules) intended only for use in sterilization devices, when containing less than 30 mℓ of ethylene oxide per inner packaging with not more than 300 mℓ per outer packaging, may be transported in accordance with the provisions in chapter 3.5, irrespective of the indication of "E0" in column 7b of the Dangerous Goods List provided that:

.1 After filling, each glass inner receptacle has been determined to be leak tight by placing the glass inner receptacle in a hot water bath at a temperature, and for a period of time, sufficient to ensure that an internal pressure equal to the vapour pressure of ethylene oxide at 55°C is achieved. Any glass inner receptacle showing evidence of leakage, distortion or other defect under this test shall not be transported under the terms of this special provision;

.2 In addition to the packaging required by 3.5.2, each glass inner receptacle is placed in a sealed plastics bag compatible with ethylene oxide and capable of containing the contents in the event of breakage or leakage of the glass inner receptacle; and

.3 Each glass inner receptacle is protected by a means of preventing puncture of the plastics bag (e.g., sleeves or cushioning) in the event of damage to the packaging (e.g., by crushing).

343 This entry applies to crude oil containing hydrogen sulphide in sufficient concentration that vapours evolved from the crude oil can present an inhalation hazard. The packing group assigned shall be determined by the flammability hazard and inhalation hazard, in accordance with the degree of danger presented.

344 The provisions of 6.2.4 shall be met.

345 This gas contained in open cryogenic receptacles with a maximum capacity of 1 litre constructed with glass double walls having the space between the inner and outer wall evacuated (vacuum insulated) is not subject to the provisions of this Code provided each receptacle is transported in an outer packaging with suitable cushioning or absorbent materials to protect it from impact damage.

346 Open cryogenic receptacles conforming to the requirements of packing instruction P203 and containing no dangerous goods except for UN 1977, nitrogen, refrigerated liquid, which is fully absorbed in a porous material, are not subject to any other provisions of this Code.

347 This entry shall only be used if the results of Test series 6 (d) of part I of the United Nations *Manual of Tests and Criteria* have demonstrated that any hazardous effects arising from functioning are confined within the package.

348 Batteries manufactured after 31 December 2011 shall be marked with the Watt hour rating on the outside case.

349 Mixtures of a hypochlorite with an ammonium salt are not to be accepted for transport. UN 1791 hypochlorite solution is a substance of class 8.

350 Ammonium bromate and its aqueous solutions and mixtures of a bromate with an ammonium salt are not to be accepted for transport.

351 Ammonium chlorate and its aqueous solutions and mixtures of a chlorate with an ammonium salt are not to be accepted for transport.

352 Ammonium chlorite and its aqueous solutions and mixtures of a chlorite with an ammonium salt are not to be accepted for transport.

353 Ammonium permanganate and its aqueous solutions and mixtures of a permanganate with an ammonium salt are not to be accepted for transport.

354 This substance is toxic by inhalation.

355 Oxygen cylinders for emergency use transported under this entry may include installed actuating cartridges (cartridges, power device of class 1.4, compatibility group C or S), without changing the classification of class 2.2 provided the total quantity of deflagrating (propellant) explosives does not exceed 3.2 g per oxygen cylinder. The cylinders with the installed actuating cartridges as prepared for transport shall have an effective means of preventing inadvertent activation.

356 Metal hydride storage systems installed in vehicles, vessels or aircrafts or in completed components or intended to be installed in vehicles, vessels or aircrafts shall be approved by the competent authority before acceptance for transport. The transport document shall include an indication that the package was approved by the competent authority or a copy of the competent authority approval shall accompany each consignment.

357 Petroleum crude oil containing hydrogen sulphide in sufficient concentration that vapours evolved from the crude oil can present an inhalation hazard shall be consigned under the entry UN 3494 PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC.

358 Nitroglycerin solution in alcohol with more than 1% but not more than 5% nitroglycerin may be classified in Class 3 and assigned to UN 3064 provided all the requirements of packing instruction P300 are complied with.

359 Nitroglycerin solution in alcohol with more than 1% but not more than 5% nitroglycerin shall be classified in Class 1 and assigned to UN 0144 if not all the requirements of packing instruction P300 are complied with.

360 Vehicles only powered by lithium metal batteries or lithium ion batteries shall be consigned under the entry UN 3171 BATTERY POWERED VEHICLE.

361 This entry applies to electric double layer capacitors with an energy storage capacity greater than 0.3 Wh. Capacitors with an energy storage capacity of 0.3 Wh or less are not subject to the provisions of this Code. Energy storage capacity means the energy held by a capacitor, as calculated using the nominal voltage and capacitance. All capacitors to which this entry applies, including capacitors containing an electrolyte that does not meet the classification criteria of any class or division of dangerous goods, shall meet the following conditions:

.1 Capacitors not installed in equipment shall be transported in an uncharged state. Capacitors installed in equipment shall be transported either in an uncharged state or protected against short circuit;

.2 Each capacitor shall be protected against a potential short circuit hazard in transport as follows:

(i) When a capacitor's energy storage capacity is less than or equal to 10 Wh or when the energy storage capacity of each capacitor in a module is less than or equal to 10 Wh , the capacitor or module shall be protected against short circuit or be fitted with a metal strap connecting the terminals; and

(ii) When the energy storage capacity of a capacitor or a capacitor in a module is more than 10 Wh, the capacitor or module shall be fitted with a metal strap connecting the terminals;

.3 Capacitors containing dangerous goods shall be designed to withstand a 95 kPa pressure differential;

.4 Capacitors shall be designed and constructed to safely relieve pressure that may build up in use, through a vent or a weak point in the capacitor casing. Any liquid which is released upon venting shall be contained by the packaging or by the equipment in which a capacitor is installed; and

.5 Capacitors shall be marked with the energy storage capacity in Wh

Capacitors containing an electrolyte not meeting the classification criteria of any class or division of dangerous goods, including when installed in equipment, are not subject to other provisions of this Code.

Capacitors containing an electrolyte meeting the classification criteria of any class or division of dangerous goods, with an energy storage capacity of 10 Wh or less are not subject to other provisions of this Code when they are capable of withstanding a 1.2 metre drop test unpackaged on an unyielding surface without loss of contents.

Capacitors containing an electrolyte meeting the classification criteria of any class or division of dangerous goods that are not installed in equipment and with an energy storage capacity of more than 10 Wh are subject to the provisions of this Code.

Capacitors installed in the equipment and containing an electrolyte meeting the classification criteria of any class or division of dangerous goods, are not subject to other provisions of this Code provided the equipment is packaged in a strong outer packaging constructed of suitable material and of adequate strength and design, in relation to the packaging's intended use and in such a manner as to prevent accidental functioning of capacitors during transport. Large robust equipment containing capacitors may be offered for transport unpackaged or on pallets when capacitors are afforded equivalent protection by the equipment in which they are contained.

Note: Capacitors which by design maintain a terminal voltage (e.g., asymmetrical capacitors) do not belong to this entry.

362 This entry applies to liquids, pastes or powders, pressurized with a propellant which meets the definition of a gas in 2.2.1.1 and 2.2.1.2 (.1) or (.2).

Note: A chemical under pressure in an aerosol dispenser shall be transported under UN 1950.

The following provisions shall apply:

.1 The chemical under pressure shall be classified based on the hazard characteristics of the components in the different states:

- the propellant;
- the liquid; or
- the solid.

If one of these components, which can be a pure substance or a mixture, needs to be classified as flammable, the chemical under pressure shall be classified as flammable in class 2.1. Flammable components are flammable liquids and liquid mixtures, flammable solids and solid mixtures or flammable gases and gas mixtures meeting the following criteria:

(i) A flammable liquid is a liquid having a flashpoint of not more than 93°C;

(ii) A flammable solid is a solid which meets the criteria in 2.4.2.2 of this Code;

(iii) A flammable gas is a gas which meets the criteria in 2.2.2.1 of this Code;

.2 Gases of class 2.3 and gases with a subsidiary risk of 5.1 shall not be used as a propellant in a chemical under pressure;

.3 Where the liquid or solid components are classified as dangerous goods of class 6.1, packing groups II or III, or class 8, packing groups II or III, the chemical under pressure shall be assigned a subsidiary risk of class 6.1 or class 8 and the appropriate UN number shall be assigned. Components classified in class 6.1, packing group I, or class 8, packing group I, shall not be used for transport under this proper shipping name;

.4 In addition, chemicals under pressure with components meeting the properties of: class 1, explosives; class 3, liquid desensitized explosives; class 4.1, 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 6.2, Infectious substances or class 7, Radioactive material, shall not be used for transport under this proper shipping name;

.5 Substances to which PP86 or TP7 are assigned in Column 9 and Column 14 of the Dangerous Goods List in Chapter 3.2 and therefore require air to be eliminated from the vapour space, shall not be used for transport under this UN number but shall be transported under their respective UN numbers as listed in the Dangerous Goods List of Chapter 3.2.

363 This entry also applies to dangerous goods above the quantity specified in Column 7a of the Dangerous Goods List of Chapter 3.2 in means of containment (other than vehicles or means of containment defined in Part 6 of these Code subject to special provision 301) integral to equipment or machinery (e.g. generators, compressors, heating units, etc) as part of their original design type. They are not subject to any other provisions of this Code if the following provisions are met:

.1 the means of containment shall be in compliance with the construction requirements of the competent authority;

.2 any valves or openings (e.g. venting devices) in the means of containment containing dangerous goods shall be closed during transport;

.3 the machinery or equipment shall be loaded in an orientation to prevent inadvertent leakage of dangerous goods and secured by means capable of restraining the machinery or equipment to prevent any movement during transport which would change the orientation or cause it to be damaged;

.4 where the means of containment has a capacity of not more than 450 l, the labelling requirements of 5.2.2 and, when necessary, the marking requirements of 5.2.1.6 shall apply and, where the capacity is greater than 450 l but not more than 1 500 l, the machinery or equipment shall be labelled on all four external sides in accordance with 5.2.2 and, when necessary, shall be marked in accordance with 5.2.1.6 ;

.5 where the means of containment has a capacity greater than 1500 l, the machinery or equipment shall be placarded on all four external sides in accordance with 5.3.1.1.2 and, when necessary, shall be marked in accordance with 5.2.1.6 ;

.6 the provisions of Part 2, Part 3 except columns (8) to (14) of the dangerous goods list in 3.2, 5.1.1 except 5.1.1.4, 5.3 except 5.3.2.0 and 5.3.2.1, 5.4 and Part 7 shall apply.

.7 the transport of machinery or equipment where the quantity of substance exceeds 1500 l is authorized when approved by the competent authority.

364 This article may only be transported under the provisions of Chapter 3.4 if, as presented for transport, the package is capable of passing the test in accordance with Test Series 6(d) of Part I of the Manual of Tests and Criteria as determined by the competent authority.

365 For manufactured instruments and articles containing mercury, see UN 3506.

366 Manufactured instruments and articles containing not more than 1 kg of mercury are not subject to the provisions of this Code.

900 The transport of the following substances is prohibited:

AMMONIUM HYPOCHLORITE

AMMONIUM NITRATE liable to self-heating sufficient to initiate decomposition

AMMONIUM NITRITES and mixtures of an inorganic nitrite with an ammonium salt

CHLORIC ACID, AQUEOUS SOLUTION with more than 10% chloric acid

ETHYL NITRITE pure

HYDROCYANIC ACID, AQUEOUS SOLUTION (HYDROGEN CYANIDE, AQUEOUS SOLUTION) with more than 20% hydrogen cyanide

HYDROGEN CHLORIDE, REFRIGERATED LIQUID

HYDROGEN CYANIDE SOLUTION, IN ALCOHOL with more than 45% hydrogen cyanide

MERCURY OXYCYANIDE pure

METHYL NITRITE

PERCHLORIC ACID with more than 72% acid, by mass

SILVER PICRATE, dry or wetted with less than 30% water by mass

ZINC AMMONIUM NITRITE

See also special provisions 349, 350, 351, 352 and 353.

903 HYPOCHLORITE MIXTURES with 10% or less available CHLORINE are not subject to the provisions of this Code.

904 The provisions of this Code, except for the marine pollution aspects, do not apply to these substances if they are completely miscible with water, except when transported in receptacles with a capacity greater than 250 ℓ and in tanks.

905 May only be shipped as an 80% solution in TOLUENE. The pure product is shock-sensitive and decomposes with explosive violence and the possibility of detonation when heated under confinement. Can be ignited by impact.

907 The consignment shall be accompanied by a certificate from a recognized authority stating:

- moisture content;
- fat content;
- details of anti-oxidant treatment for meals older than 6 months (for UN 2216 only);
- anti-oxidant concentration at the time of shipment, which must exceed 100 mg/kg (for UN 2216 only);
- packing, number of bags and total mass of the consignment;
- temperature of fishmeal at the time of despatch from the factory;
- date of production.

No weathering/curing is required prior to loading. Fishmeal under UN 1374 shall have been weathered for not less than 28 days before shipment.

When fishmeal is packed into containers, the containers shall be packed in such a way that the free air space has been restricted to the minimum.

912 This entry also covers solutions in water with concentrations above 70%.

915 This entry shall not be used for wetted explosives, self-reactive substances or metal powders.

916 The provisions of this Code do not apply to this substance when:

- mechanically produced, with a particle size of 53 microns or greater; or
- chemically produced, with a particle size of 840 microns or greater.

917 Scrap with rubber content below 45% or exceeding 840 microns and fully vulcanized hard rubber are not subject to the provisions of this Code.

919 UREA NITRATE, WETTED with not less than 10% water, by mass, may be transported under the provisions of this class, provided it is packaged in accordance with packing instruction P002.

920 Bars, ingots or sticks are not subject to the provisions of this Code.

921 Zirconium, dry, 254 microns or thicker is not subject to the provisions of this Code.

922 LEAD PHOSPHITE, DIBASIC which is accompanied by the certificate from the shipper stating that the substance, as offered for shipment, has been stabilized in such a way that it does not possess the properties of class 4.1 is not subject to the provisions of this Code.

923 The temperature shall be checked regularly.

925 The provisions of this Code do not apply to:

- non-activated carbon blacks of mineral origin;
- a consignment of carbon if it passes the tests for self-heating substances as reflected in the United Nations *Manual of Tests and Criteria* (see 33.3.1.3.3), and is accompanied by a certificate from a laboratory accredited by the competent authority, stating that the product to be loaded has been correctly sampled by trained staff from that laboratory and that the sample was correctly tested and has passed the test; and
- carbons made by a steam activation process.

926 This substance shall preferably have been weathered for not less than one month before shipment unless a certificate from a person recognized by the competent authority of the country of shipment states a maximum moisture content of 5%.

927 *p*-Nitrosodimethylaniline, wetted with more than 50% water is not subject to the provisions of this Code.

928 The provisions of this Code shall not apply to:

- fishmeal when acidified and wetted with more than 40% water, by mass, irrespective of other factors;
- consignments of fishmeal which are accompanied by a certificate issued by a recognized competent authority of the country of shipment or other recognized authority stating that the product has no self-heating properties when transported in packaged form; or
- fishmeal manufactured from “white” fish with a moisture content of not more than 12% and a fat content of not more than 5% by mass.

929 If satisfied, as a result of tests, that such relaxation is justified, the competent authority may permit:

- the seed cakes described as “SEED CAKE, containing vegetable oil (a) mechanically expelled seeds, containing more than 10% of oil or more than 20% of oil and moisture combined” to be transported under conditions governing “SEED CAKE, containing vegetable oil (b) solvent extractions and expelled seeds, containing not more than 10% of oil and, when the amount of moisture is higher than 10% not more than 20% of oil and moisture combined”, and
- the seed cakes described as “SEED CAKE, containing vegetable oil (b) solvent extractions and expelled seeds, containing not more than 10% of oil and, when the amount of moisture is higher than 10% not more than 20% of oil and moisture combined” to be transported under conditions governing SEED CAKE, UN 2217.

Certificates from the shipper shall state oil content and moisture content and shall accompany the shipment.

930 All pesticides can only be carried under the provisions of this class if accompanied by a certificate supplied by the shipper stating that, when in contact with water, it is not combustible and does not show tendency to autoignition, and that the mixture of gases evolved is not flammable. Otherwise, the provisions of class 4.3 shall be applicable.

931 A consignment of this substance which is accompanied by a declaration from the shipper stating that it has no self-heating properties is not subject to the provisions of this Code.

932 Requires a certificate from the maker or shipper, stating that the shipment was stored under cover, but in the open air, in the size in which it was packaged, for not less than 3 days prior to shipment.

934 Requires the percentage range of calcium carbide impurity to be shown on the shipping documents.

935 Substances which do not evolve flammable gases when wet, which are accompanied by a certificate from the shipper stating that the substance, as offered for shipment, does not evolve flammable gases when wet, are not subject to the provisions of this Code.

937 The solid hydrated form of this substance is not subject to the provisions of this Code.

939 A consignment of this substance that is accompanied by a shipper's certificate stating that it does not contain more than 0.05% maleic anhydride is not subject to the provisions of this Code.

942 The concentration and temperature of the solution at the time of loading, its percentage of combustible material and of chlorides as well as the contents of free acid shall be certified.

943 Water-activated articles shall bear a subsidiary risk of class 4.3.

945 Stabilization of fishmeal shall be achieved to prevent spontaneous combustion by effective application of between 400 and 1000 mg/kg (ppm) ethoxyquin, or liquid BHT (butylated hydroxytoluene) or between 1000 and 4000 mg/kg (ppm) BHT in powder form at the time of production. The said application shall occur no longer than twelve months prior to shipment.

946 Requires certification from the shipper that the substance is not of class 4.2.

948 These substances may be transported in bulk in cargo transport units only if their melting point is 75°C or above.

951 Bulk container shall be hermetically sealed and under a nitrogen blanket.

952 UN 1942 may be transported in bulk container if approved by the competent authority.

954 The provisions of this Code shall not apply to consignments of compressed baled hay with a moisture content of less than 14% shipped in closed cargo transport units and accompanied by a certificate from the shipper stating that the product does not present any class 4.1, UN 1327, hazard in transport and that its moisture content is less than 14%.

955 If a viscous substance and its packaging fulfils the provisions of 2.3.2.5, the packing provisions of chapter 4.1, the marking and labelling provisions of chapter 5.2 and the package testing provisions of chapter 6.1 are not applicable.

957 Lithium cells and batteries manufactured before 1 January 2003 that have not been tested in accordance with the requirements in chapter 38.3 of the United Nations *Manual of Tests and Criteria*, as well as articles which contain such lithium cells or batteries, may be transported until 31 December 2013 if all applicable provisions of this Code are met.

958 This entry covers articles, such as rags, cotton waste, clothing or sawdust, containing polychlorinated biphenyls, polyhalogenated biphenyls or polyhalogenated terphenyls where no free visible liquid is present.

959 Waste aerosols authorized for transport under special provision 327 shall only be transported on short international voyages. Long international voyages are authorized only with the approval of the competent authority. Packagings shall be marked and labelled and cargo transport units shall be marked and placarded for appropriate sub-division of class 2 and, if applicable, the subsidiary risk(s).

960 Not subject to the provisions of this Code but may be subject to provisions governing the transport of dangerous goods by other modes.

961 Vehicles and equipment are not subject to the provisions of this Code if they are stowed on a roll-on/roll-off ship or in another cargo space designated by the Administration (flag State) as specifically designed and approved for the carriage of vehicles and equipment and there are no signs of leakage from the battery, engine, fuel cell, compressed gas cylinder or accumulator, or fuel tank when applicable.

In addition, vehicles and equipment are not subject to the provisions of this Code if any of the following conditions are met:

.1 The fuel tank(s) of the vehicle or equipment powered by a flammable liquid fuel is empty and installed batteries are protected from short circuit;

.2 The fuel tank(s) of the vehicle or equipment powered by a flammable gas is emptied of liquefied or compressed gas, the positive pressure in the tank does not exceed 2 bar, the fuel shut-off or isolation valve is closed and secured, and installed batteries are protected from short circuit; or

.3 The vehicle or equipment is solely powered by a wet or dry electric storage battery or a sodium battery, and the battery is protected from short circuit.

962 Vehicles or equipment powered by internal combustion engines, fuel cells or batteries not meeting the conditions of special provision 961 shall be assigned to class 9 and shall meet the following requirements:

.1 vehicles and equipment shall not show signs of leakage from batteries, engines, fuel cells, compressed gas cylinders or accumulators, or fuel tank(s) when applicable;

.2 for flammable liquid powered vehicles and equipment, the fuel tank(s) containing the flammable liquid shall not be more than one fourth full and in any case the flammable liquid shall not exceed 250 ℓ;

.3 for flammable gas powered vehicles and equipment, the fuel shut-off valve of the fuel tank(s) shall be securely closed;

.4 installed batteries shall be protected from damage, short circuit, and accidental activation during transport. Lithium ion or lithium metal batteries shall meet the requirements of the United Nations *Manual of Tests and Criteria*, part III, subsection 38.3, unless otherwise approved by the competent authority; and

.5 dangerous goods required for the operation of the vehicle or equipment such as fire extinguishers, compressed gas accumulators, airbag inflators, etc., shall be securely mounted in the vehicle or equipment.

The marking, labelling and placarding provisions of this Code shall not apply.

963 Nickel-metal hydride button cells or nickel-metal hydride cells or batteries packed with or contained in equipment are not subject to the provisions of this Code.

All other nickel-metal hydride cells or batteries shall be securely packed and protected from short circuit. They are not subject to other provisions of this Code provided that they are loaded in a cargo transport unit in a total quantity of less than 100 kg gross mass. When loaded in a cargo transport unit in a total quantity of 100 kg gross mass or more, they are not subject to other provisions of this Code except those of 5.4.1, 5.4.3 and column (16) of the Dangerous Goods List in chapter 3.2.

964 This substance is not subject to the provisions of this Code when transported in non-friable prills or granules form and if it passes the test for oxidizing solid substances as reflected in the United Nations *Manual of Tests and Criteria* (see 34.4.1) and is accompanied by a certificate from a laboratory accredited by a competent authority, stating that the product has been correctly sampled by trained staff from the laboratory and that the sample was correctly tested and has passed the test.

965 .1 When transported in cargo transport units, the cargo transport units shall provide an adequate exchange of air in the unit (e.g., by using a ventilated container, open-top container or container in one door off operation) to prevent the build-up of an explosive atmosphere. Alternatively, these entries shall be transported under temperature control in refrigerated cargo transport units that comply with the provisions of 7.3.7.6. When cargo transport units with venting devices are used, these devices shall be kept clear and operable. When mechanical devices are used for ventilation, they shall be explosion-proof to prevent ignition of flammable vapours from the substances.

.2 The provisions of .1 do not apply if:

a) the substance is packed in hermetically sealed packagings or IBCs, which conform to packing group II performance level for liquid dangerous goods according to the provisions of 6.1 or 6.5, respectively; and

b) the marked hydraulic test pressure exceeds 1.5 times the total gauge pressure in the packagings or IBCs determined at 55°C for the respective filling goods according to 4.1.1.10.1.

.3 Where the substance is loaded in closed cargo transport units, the provisions of 7.3.6.1 shall be met.

.4 Cargo transport units shall be marked with a warning mark including the words “CAUTION – MAY CONTAIN FLAMMABLE VAPOUR” with lettering not less than 25 mm high. This mark shall be affixed at each access point in a location where it will be easily seen by persons prior to opening or entering the cargo transport unit and shall remain on the cargo transport unit until the following provisions are met:

a) the cargo transport unit has been completely ventilated to remove any hazardous concentration of vapour or gas;

b) the immediate vicinity of the cargo transport unit is clear of any source of ignition; and

c) the goods have been unloaded.

966 Sheeted bulk containers (BK1) are only permitted in accordance with 4.3.3.

967 Flexible bulk containers (BK3) are only permitted in accordance with 4.3.4.

Chapter 3.4

Dangerous goods packed in limited quantities

3.4.1 General

3.4.1.1 This Chapter provides the provisions applicable to the transport of dangerous goods of certain classes packed in limited quantities. The applicable quantity limit for the inner packaging or article is specified for each substance in Column 7a of the Dangerous Goods List of Chapter 3.2. In addition, the quantity "0" has been indicated in this column for each entry not permitted to be transported in accordance with this Chapter.

3.4.1.2 Limited quantities of dangerous goods packed in such limited quantities, meeting the provisions of this Chapter, are not subject to any other provisions of this Code except the relevant provisions of:

.1 Part 1, Chapters 1.1, 1.2 and 1.3;

.2 Part 2;

.3 Part 3, Chapters 3.1, 3.2, 3.3;

.4 Part 4, 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8;

.5 Part 5, 5.1.1 except 5.1.1.4, 5.1.2.3, 5.2.1.7, 5.2.1.9, 5.3.2.3, 5.3.2.4, and chapter 5.4;

.6 Part 6, construction requirements of 6.1.4, 6.2.1.2 and 6.2.4;

.7 Part 7, 7.1.3.2, 7.6.3.1 and 7.3 except 7.3.3.15 and 7.3.4.1.

3.4.2 Packing

3.4.2.1 Dangerous goods shall be packed only in inner packagings placed in suitable outer packagings. Intermediate packagings may be used. In addition, for articles of Division 1.4, Compatibility Group S, the provisions of section 4.1.5 shall be fully complied with. The use of inner packagings is not necessary for the transport of articles such as aerosols or "receptacles, small, containing gas". The total gross mass of the package shall not exceed 30 kg.

3.4.2.2 Except for articles of Division 1.4, Compatibility Group S, shrink-wrapped or stretch-wrapped trays meeting the conditions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8 are acceptable as outer packagings for articles or inner packagings containing dangerous goods transported in accordance with this Chapter. Inner packagings that are liable to break or be easily punctured, such as those made of glass, porcelain, stoneware or certain plastics, shall be placed in suitable intermediate packagings meeting the provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8, and be so designed that they meet the construction requirements of 6.1.4. The total gross mass of the package shall not exceed 20 kg.

3.4.2.3 Liquid goods of Class 8, packing group II in glass, porcelain or stoneware inner packagings shall be enclosed in a compatible and rigid intermediate packaging.

3.4.3 Stowage

Dangerous goods packed in limited quantity are allocated stowage category A as defined in 7.1.3.2. The other stowage provisions indicated in column (16) of the Dangerous Goods List are not applicable.

3.4.4 Segregation

3.4.4.1 Different dangerous substances in limited quantities may be packed in the same outer packaging, provided:

.1 the substances comply with the provisions of 7.2.6.1; and

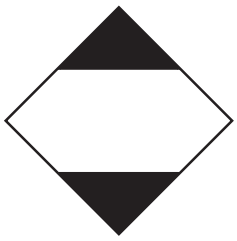
.2 the segregation provisions of chapter 7.2, including the segregation provisions in column (16) of the Dangerous Goods List, are taken into account. However, notwithstanding the individual provisions specified in the Dangerous Goods List, substances in packing group III within the same class may be

packed together subject to compliance with 3.4.4.1.1 of the IMDG Code. The following statement shall be included in the transport document: ''Transport in accordance with 3.4.4.1.2 of the IMDG Code'' (see 5.4.1.5.2.2).

3.4.4.2 The segregation provisions of chapter 7.2 are not applicable for packagings containing dangerous goods in limited quantities or in relation to other dangerous goods.

3.4.5 Marking and placarding

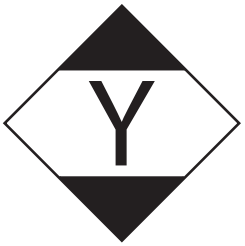
3.4.5.1 Except for air transport, packages containing dangerous goods in limited quantities shall bear the marking shown below:



Marking for packages containing limited quantities

The marking shall be readily visible, legible and able to withstand open weather exposure without a substantial reduction in effectiveness. The top and bottom portions and the surrounding line shall be black. The centre area shall be white or a suitable contrasting background. The minimum dimensions shall be 100 mm × 100 mm and the minimum width of line forming the diamond shall be 2 mm. If the size of the package so requires, the dimension may be reduced, to be not less than 50 mm × 50 mm provided the marking remains clearly visible.

3.4.5.2 Packages containing dangerous goods consigned for air transport in conformity with the provisions of Part 3, Chapter 4 of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air shall bear the marking shown below:



Marking for packages containing limited quantities conforming to part 3, chapter 4 of the ICAO *Technical Instructions for the Safe Transport of Dangerous Goods by Air*

The marking shall be readily visible, legible and able to withstand open weather exposure without a substantial reduction in effectiveness. The top and bottom portions and the surrounding line shall be black. The centre area shall be white or a suitable contrasting background. The minimum dimensions shall be 100 mm × 100 mm. The minimum width of line forming diamond shall be 2 mm. The symbol "Y" shall be placed in the centre of the mark and shall be clearly visible. If the size of the package so requires, the dimension may be reduced, to be not less than 50 mm × 50 mm provided the marking remains clearly visible.

3.4.5.3 Packages containing dangerous goods bearing the marking shown in 3.4.5.2 shall be deemed to meet the provisions of sections 3.4.1 and 3.4.2 of this Chapter and need not bear the marking shown in 3.4.5.1.

3.4.5.4 When packages containing dangerous goods packed in limited quantities are placed in an overpack or in a unit load, the overpack or the unit load shall be marked with the marking required by this chapter unless the markings representative of all dangerous goods in the overpack or the unit load are visible. In addition, an overpack shall be marked with the word "OVERPACK" unless markings representative of all dangerous goods, as required by this chapter, in the overpack are visible. The other provisions of 5.1.2.1 apply only if other dangerous goods which are not packed in limited quantities are contained in the overpack or in a unit load and only in relation to these other dangerous goods.

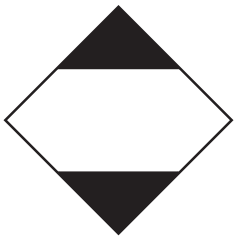
3.4.5.5 Placarding and marking of cargo transport unit

3.4.5.5.1 Cargo transport unit containing dangerous goods packed in limited quantities with no other dangerous goods shall not be placarded nor marked according to 5.3.2.0 and 5.3.2.1. However, they shall be suitably marked on the exterior with the mark in 3.4.5.5.4.

3.4.5.5.2 Cargo transport units containing dangerous goods and dangerous goods packed in limited quantities shall be placarded and marked according to the provisions applicable to the dangerous goods which are not packed in limited quantities. However, if no placard or mark is required for the dangerous goods not packed in limited quantities, the cargo transport units shall be marked with the mark in 3.4.5.5.4.

3.4.5.5.3 In all cases, if the dangerous goods packed in limited quantities are marine pollutants, the cargo transport units shall bear the marine pollutant mark as indicated in 5.3.2.3.

3.4.5.5.4 When required in 3.4.5.5.1 or 3.4.5.5.2, the following mark shall be affixed on cargo transport units :



The marking shall be readily visible, legible and be such that this information will still be identifiable on cargo transport units surviving at least three months' immersion in the sea. In considering suitable marking methods, account shall be taken of ease with which the surface of the cargo transport unit can be marked. The top and bottom portions and the surrounding line shall be black. The centre area shall be white or a suitable contrasting background. The minimum dimensions shall be of 250 mm x 250 mm in locations indicated in 5.3.1.1.4.1.

3.4.6 Documentation

3.4.6.1 In addition to the provisions for documentation specified in chapter 5.4, the words ''limited quantity'' or ''LTD QTY'' shall be included on the dangerous goods declaration together with the description of the shipment.

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 this Code except for:

.1 The training provisions in chapter 1.3;

.2 The classification procedures and packing group criteria in Part 2, Classification;

.3 The packaging provisions of 4.1.1.1, 4.1.1.2, 4.1.1.4, 4.1.1.4.1 and 4.1.1.6 in Part 4; and

.4 The provisions for documentation specified in chapter 5.4.

Note: In the case of radioactive material, the provisions for radioactive material in excepted packages in 1.5.1.5 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 the Dangerous Goods 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 packaging)
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.

3.5.1.4 Excepted quantities of dangerous goods assigned to codes E1, E2, E4 and E5 are not subject to the provisions of this Code provided that:

.1 The maximum net quantity of material per inner packaging is limited to 1 mℓ for liquids and gases and 1 g for solids;

.2 The provisions of 3.5.2 are met, except that an intermediate packaging is not required if the inner packagings are securely packed in an outer packaging with cushioning material in such a way that, under normal conditions of transport, they cannot break, be punctured, or leak their contents; and for liquid dangerous goods, the outer packaging contains sufficient absorbent material to absorb the entire contents of the inner packagings;

.3 The provisions of 3.5.3 are complied with; and

.4 The maximum net quantity of dangerous goods per outer packaging does not exceed 100 g for solids or 100 mℓ for liquids and gases.

3.5.2 Packagings

3.5.2.1 Packagings used for the transport of dangerous goods in excepted quantities shall be in compliance with the following:

.1 There shall be an inner packaging and each inner packaging shall be constructed of plastic (when used for liquid dangerous goods it shall have a thickness of not less than 0.2 mm), or of glass, porcelain, stoneware, earthenware or metal (see also 4.1.1.2) 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 leakproof threaded-type cap. The closure shall be resistant to the contents;

.2 Each inner packaging shall be securely packed in an intermediate packaging with cushioning material in such a way that, under normal conditions of transport, 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 liquid dangerous goods, 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;

.3 The intermediate packaging shall be securely packed in a strong, rigid outer packaging (wooden, fibreboard or other equally strong material);

.4 Each package type shall be in compliance with the provisions in 3.5.3;

.5 Each package shall be of such a size that there is adequate space to apply all necessary markings; and

.6 Overpacks may be used and may also contain packages of dangerous goods or goods not subject to the provisions of this Code.

3.5.3 Tests for packages

3.5.3.1 The complete package as prepared for transport, 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:

.1 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.

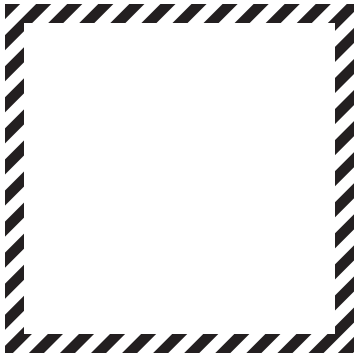
Note: Each of the above drops may be performed on different but identical packages.

.2 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).

3.5.3.2 For the purposes of testing, the substances to be transported 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 shall 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 shall be similar to those of the substance to be transported.

3.5.4 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 below. The primary hazard class of 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.



Excepted quantities mark

Hatching and symbol of the same colour, black or red,
on white or suitable contrasting background

* The class, or, when assigned, the division number(s), 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.

3.5.4.2 The dimensions of the mark shall be a minimum of 100 mm × 100 mm.

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 cargo transport unit

3.5.5.1 The number of packages containing dangerous goods packed in excepted quantities in any cargo transport unit shall not exceed 1000.

3.5.6 Documentation

3.5.6.1 In addition to the provisions for documentation specified in chapter 5.4, the words “dangerous goods in excepted quantities” and the number of packages shall be included on the dangerous goods declaration together with the description of the shipment.

3.5.7 Stowage

3.5.7.1 Dangerous goods packed in excepted quantity are allocated stowage category A as defined in 7.1.3.2. The other stowage provisions indicated in column (16) of the Dangerous Goods List are not applicable.

3.5.8 Segregation

3.5.8.1 The segregation provisions of chapters 7.2 to 7.7, including the segregation provisions in column (16) of the Dangerous Goods List, are not applicable for packagings containing dangerous goods packed in excepted quantities or in relation to other dangerous goods.

3.5.8.2 The segregation provisions of chapters 7.2 to 7.7, including the segregation provisions in column (16) of the Dangerous Goods List, are not applicable for different dangerous goods in excepted quantities in he same outer packaging provided that they do not react dangerously with each other (see 4.1.1.6).

APPENDICES

Appendix A

List of generic and N.O.S. Proper Shipping Names

Substances or articles not mentioned specifically by name in the Dangerous Goods List in chapter 3.2 shall be classified in accordance with 3.1.1.2. Thus the name in the Dangerous Goods List which most appropriately describes the substance or article shall be used as the Proper Shipping Name. The main generic entries and all the N.O.S. entries given in the Dangerous Goods List are listed below. This Proper Shipping Name shall be supplemented by the technical name when special provision 274 or 318 has been assigned to the entry in column 6 of the Dangerous Goods List. For marine pollutants, see also 3.1.2.9.

In this list, general and N.O.S. names are grouped according to their hazard class or division. Within each hazard class or division, the names have been placed into three groups as follows:

- specific entries covering a group of substances or articles of a particular chemical or technical nature;
- pesticide entries, for class 3 and class 6.1;
- general entries covering a group of substances or articles having one or more general dangerous properties.

THE MOST SPECIFIC APPLICABLE NAME SHALL ALWAYS BE USED.

Class or division	Subsidiary risk	UN Number	Proper Shipping Name
			CLASS 1
1		0190	SAMPLES, EXPLOSIVE, other than initiating explosive
			Division 1.1
1.1A		0473	SUBSTANCES, EXPLOSIVE, N.O.S.
1.1B		0461	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.
1.1C		0462	ARTICLES, EXPLOSIVE, N.O.S.
1.1C		0474	SUBSTANCES, EXPLOSIVE, N.O.S.
1.1C		0497	**PROPELLANT, LIQUID**
1.1C		0498	PROPELLANT, SOLID
1.1D		0463	ARTICLES, EXPLOSIVE, N.O.S.
1.1D		0475	SUBSTANCES, 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		0354	ARTICLES, EXPLOSIVE, N.O.S.
1.1L		0357	SUBSTANCES, EXPLOSIVE, N.O.S.
			Division 1.2
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.
1.2K	6.1	0020	AMMUNITION, TOXIC with burster, expelling charge or propelling charge
1.2L	4.3	0248	CONTRIVANCES, WATER-ACTIVATED with burster, expelling charge or propelling charge
1.2L		0355	ARTICLES, EXPLOSIVE, N.O.S.
1.2L		0358	SUBSTANCES, EXPLOSIVE, N.O.S.
			Division 1.3
1.3C		0132	DEFLAGRATING METAL SALTS OF AROMATIC NITRO-DERIVATIVES, N.O.S.
1.3C		0470	ARTICLES, EXPLOSIVE, N.O.S.
1.3C		0477	SUBSTANCES, EXPLOSIVE, N.O.S.
1.3C		0495	PROPELLANT, LIQUID
1.3C		0499	PROPELLANT, SOLID
1.3G		0478	SUBSTANCES, EXPLOSIVE, N.O.S.
1.3K	6.1	0021	AMMUNITION, TOXIC with burster, expelling charge or propelling charge
1.3L	4.3	0249	CONTRIVANCES, WATER-ACTIVATED with burster, expelling charge or propelling charge
1.3L		0356	ARTICLES, EXPLOSIVE, N.O.S.
1.3L		0359	SUBSTANCES, EXPLOSIVE, N.O.S.
			Division 1.4
1.4B		0350	ARTICLES, EXPLOSIVE, N.O.S.
1.4B		0383	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.
1.4C		0351	ARTICLES, EXPLOSIVE, N.O.S.
1.4C		0479	SUBSTANCES, EXPLOSIVE, N.O.S.
1.4C		0501	PROPELLANT, SOLID
1.4D		0352	ARTICLES, EXPLOSIVE, N.O.S.
1.4D		0480	SUBSTANCES, EXPLOSIVE, N.O.S.
1.4E		0471	ARTICLES, EXPLOSIVE, N.O.S.
1.4F		0472	ARTICLES, EXPLOSIVE, N.O.S.
1.4G		0353	ARTICLES, EXPLOSIVE, N.O.S.
1.4G		0485	SUBSTANCES, EXPLOSIVE, N.O.S.
1.4S		0349	ARTICLES, EXPLOSIVE, N.O.S.
1.4S		0384	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.
1.4S		0481	SUBSTANCES, EXPLOSIVE, N.O.S.
			Division 1.5
1.5D		0482	SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE (SUBSTANCES, EVI), N.O.S.
			Division 1.6
1.6N		0486	ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE (ARTICLES, EEI)

Class or division	Subsidiary risk	UN Number	Proper Shipping Name
			CLASS 2
			Class 2.1
			Specific entries
2.1		1964	HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S.
2.1		1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.
2.1		3354	INSECTICIDE GAS, FLAMMABLE, N.O.S.
			General entries
2.1		1954	COMPRESSED GAS, FLAMMABLE, N.O.S.
2.1		3161	LIQUEFIED GAS, FLAMMABLE, N.O.S.
2.1		3167	GAS SAMPLE, NON-PRESSURIZED, FLAMMABLE, N.O.S., not refrigerated liquid
2.1		3312	GAS, REFRIGERATED LIQUID, FLAMMABLE, N.O.S.
2.1		3501	CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S.
2.1	6.1	3504	CHEMICAL UNDER PRESSURE, FLAMMABLE, TOXIC, N.O.S.
2.1	8	3505	CHEMICAL UNDER PRESSURE, FLAMMABLE, CORROSIVE, N.O.S.
			Class 2.2
			Specific entries
2.2		1078	REFRIGERANT GAS, N.O.S.
2.2		1968	INSECTICIDE GAS, N.O.S.
			General entries
2.2		1956	COMPRESSED GAS, N.O.S.
2.2		3163	LIQUEFIED GAS, N.O.S.
2.2		3158	GAS, REFRIGERATED LIQUID, N.O.S.
2.2		3500	CHEMICAL UNDER PRESSURE, N.O.S.
2.2	5.1	3156	COMPRESSED GAS, OXIDIZING, N.O.S.
2.2	5.1	3157	LIQUEFIED GAS, OXIDIZING, N.O.S.
2.2	5.1	3311	GAS, REFRIGERATED LIQUID, OXIDIZING, N.O.S.
2.2	6.1	3502	CHEMICAL UNDER PRESSURE, TOXIC, N.O.S.
2.2	8	3503	CHEMICAL UNDER PRESSURE, CORROSIVE, N.O.S.
			Class 2.3
			Specific entries
2.3		1967	INSECTICIDE GAS, TOXIC, N.O.S.
2.3	2.1	3355	INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.
			General entries
2.3		1955	COMPRESSED GAS, TOXIC, N.O.S.
2.3		3162	LIQUEFIED GAS, TOXIC, N.O.S.
2.3		3169	GAS SAMPLE, NON-PRESSURIZED, TOXIC, N.O.S., not refrigerated liquid
2.3	2.1	1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.
2.3	2.1	3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.
2.3	2.1	3168	GAS SAMPLE, NON-PRESSURIZED, TOXIC, FLAMMABLE, N.O.S., not refrigerated liquid
2.3	2.1 + 8	3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.
2.3	2.1 + 8	3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.
2.3	5.1	3303	COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S.
2.3	5.1	3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.
2.3	5.1 + 8	3306	COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.
2.3	5.1 + 8	3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.
2.3	8	3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.
2.3	8	3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.

Class or division	Subsidiary risk	UN Number	Proper Shipping Name
			CLASS 3
			Specific entries
3		1224	KETONES, LIQUID, N.O.S.
3		1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S.
3		1987	ALCOHOLS, N.O.S.
3		1989	ALDEHYDES, N.O.S.
3		2319	TERPENE HYDROCARBONS, N.O.S.
3		3271	ETHERS, N.O.S.
3		3272	ESTERS, N.O.S.
3		3295	HYDROCARBONS, LIQUID, N.O.S.
3		3336	MERCAPTANS, LIQUID, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.
3		3343	NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, FLAMMABLE, N.O.S. with not more than 30% nitroglycerin, by mass
3		3357	NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, N.O.S. with not more than 30% nitroglycerin, by mass
3		3379	DESENSITIZED EXPLOSIVE, LIQUID, N.O.S.
3	6.1	1228	MERCAPTANS, LIQUID, FLAMMABLE, TOXIC, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, TOXIC, N.O.S.
3	6.1	1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.
3	6.1	1988	ALDEHYDES, FLAMMABLE, TOXIC, N.O.S.
3	6.1	2478	ISOCYANATES, FLAMMABLE, TOXIC, N.O.S. or ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S.
3	6.1	3248	MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S.
3	6.1	3273	NITRILES, FLAMMABLE, TOXIC, N.O.S.
3	8	2733	AMINES, FLAMMABLE, CORROSIVE, N.O.S. or POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S.
3	8	2985	CHLOROSILANES, FLAMMABLE, CORROSIVE, N.O.S.
3	8	3274	ALCOHOLATES SOLUTION, N.O.S. in alcohol
			Pesticides
3	6.1	2758	CARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
3	6.1	2760	ARSENICAL PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
3	6.1	2762	ORGANOCHLORINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
3	6.1	2764	TRIAZINE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
3	6.1	2772	THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
3	6.1	2776	COPPER BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
3	6.1	2778	MERCURY BASED PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
3	6.1	2780	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
3	6.1	2782	BIPYRIDILIUM PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
3	6.1	2784	ORGANOPHOSPHORUS PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
3	6.1	2787	ORGANOTIN PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
3	6.1	3021	PESTICIDE, LIQUID, FLAMMABLE, TOXIC, N.O.S. flashpoint $<23°C$
3	6.1	3024	COUMARIN DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
3	6.1	3346	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
3	6.1	3350	PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC flashpoint $<23°C$
			General entries
3		1993	FLAMMABLE LIQUID, N.O.S.
3		3256	ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flashpoint above 60°C, at or above its flashpoint
3	6.1	1992	FLAMMABLE LIQUID, TOXIC, N.O.S.
3	6.1 + 8	3286	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.
3	8	2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S.

Class or division	Subsidiary risk	UN Number	Proper Shipping Name
			CLASS 4
			Class 4.1
			Specific entries
4.1		1353	FIBRES or FABRICS IMPREGNATED WITH WEAKLY NITRATED NITROCELLULOSE, N.O.S.
4.1		3089	METAL POWDER, FLAMMABLE, N.O.S.
4.1		3182	METAL HYDRIDES, FLAMMABLE, N.O.S.
4.1		3221	SELF-REACTIVE LIQUID TYPE B
4.1		3222	SELF-REACTIVE SOLID TYPE B
4.1		3223	SELF-REACTIVE LIQUID TYPE C
4.1		3224	SELF-REACTIVE SOLID TYPE C
4.1		3225	SELF-REACTIVE LIQUID TYPE D
4.1		3226	SELF-REACTIVE SOLID TYPE D
4.1		3227	SELF-REACTIVE LIQUID TYPE E
4.1		3228	SELF-REACTIVE SOLID TYPE E
4.1		3229	SELF-REACTIVE LIQUID TYPE F
4.1		3230	SELF-REACTIVE SOLID TYPE F
4.1		3231	SELF-REACTIVE LIQUID TYPE B, TEMPERATURE CONTROLLED
4.1		3232	SELF-REACTIVE SOLID TYPE B, TEMPERATURE CONTROLLED
4.1		3233	SELF-REACTIVE LIQUID TYPE C, TEMPERATURE CONTROLLED
4.1		3234	SELF-REACTIVE SOLID TYPE C, TEMPERATURE CONTROLLED
4.1		3235	SELF-REACTIVE LIQUID TYPE D, TEMPERATURE CONTROLLED
4.1		3236	SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED
4.1		3237	SELF-REACTIVE LIQUID TYPE E, TEMPERATURE CONTROLLED
4.1		3238	SELF-REACTIVE SOLID TYPE E, TEMPERATURE CONTROLLED
4.1		3239	SELF-REACTIVE LIQUID TYPE F, TEMPERATURE CONTROLLED
4.1		3240	SELF-REACTIVE SOLID TYPE F, TEMPERATURE CONTROLLED
4.1		3319	NITROGLYCERIN MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 2% but not more than 10% nitroglycerin, by mass
4.1		3344	PENTAERYTHRITE TETRANITRATE MIXTURE (PENTAERYTHRITOL TETRANITRATE; PETN), DESENSITIZED, SOLID, N.O.S. with more than 10% but not more than 20% PETN, by mass
4.1		3380	DESENSITIZED EXPLOSIVE, SOLID, N.O.S.
			General entries
4.1		1325	FLAMMABLE SOLID, ORGANIC, N.O.S.
4.1		3175	SOLIDS CONTAINING FLAMMABLE LIQUID, N.O.S.
4.1		3176	FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.
4.1		3178	FLAMMABLE SOLID, INORGANIC, N.O.S.
4.1		3181	METAL SALTS OF ORGANIC COMPOUNDS, FLAMMABLE, N.O.S.
4.1	5.1	3097	FLAMMABLE SOLID, OXIDIZING, N.O.S.
4.1	6.1	2926	FLAMMABLE SOLID, TOXIC, ORGANIC, N.O.S.
4.1	6.1	3179	FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S.
4.1	8	2925	FLAMMABLE SOLID, CORROSIVE, ORGANIC, N.O.S.
4.1	8	3180	FLAMMABLE SOLID, CORROSIVE, INORGANIC, N.O.S.
			Class 4.2
			Specific entries
4.2		1373	FIBRES or FABRICS, ANIMAL or VEGETABLE or SYNTHETIC, N.O.S. with oil
4.2		1378	METAL CATALYST, WETTED with a visible excess of liquid
4.2		1383	PYROPHORIC METAL, N.O.S. or PYROPHORIC ALLOY, N.O.S.
4.2		2006	PLASTICS, NITROCELLULOSE-BASED, SELF-HEATING, N.O.S.
4.2		2881	METAL CATALYST, DRY
4.2		3189	METAL POWDER, SELF-HEATING, N.O.S.
4.2		3205	ALKALINE EARTH METAL ALCOHOLATES, N.O.S.
4.2		3313	ORGANIC PIGMENTS, SELF-HEATING
4.2		3342	XANTHATES
4.2		3391	ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC
4.2		3392	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC

Class or division	Subsidiary risk	UN Number	Proper Shipping Name
			CLASS 4 *(continued)*
			Class 4.2 *(continued)*
			Specific entries *(continued)*
4.2		3400	ORGANOMETALLIC SUBSTANCE, SOLID, SELF-HEATING
4.2	4.3	3393	ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC, WATER-REACTIVE
4.2	4.3	3394	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE
4.2	8	3206	ALKALI METAL ALCOHOLATES, SELF-HEATING, CORROSIVE, N.O.S.
			General entries
4.2		2845	PYROPHORIC LIQUID, ORGANIC, N.O.S.
4.2		2846	PYROPHORIC SOLID, ORGANIC, N.O.S.
4.2		3088	SELF-HEATING SOLID, ORGANIC, N.O.S.
4.2		3183	SELF-HEATING LIQUID, ORGANIC, N.O.S.
4.2		3186	SELF-HEATING LIQUID, INORGANIC, N.O.S.
4.2		3190	SELF-HEATING SOLID, INORGANIC, N.O.S.
4.2		3194	PYROPHORIC LIQUID, INORGANIC, N.O.S.
4.2		3200	PYROPHORIC SOLID, INORGANIC, N.O.S.
4.2	5.1	3127	SELF-HEATING SOLID, OXIDIZING, N.O.S.
4.2	6.1	3128	SELF-HEATING SOLID, TOXIC, ORGANIC, N.O.S.
4.2	6.1	3184	SELF-HEATING LIQUID, TOXIC, ORGANIC, N.O.S.
4.2	6.1	3187	SELF-HEATING LIQUID, TOXIC, INORGANIC, N.O.S.
4.2	6.1	3191	SELF-HEATING SOLID, TOXIC, INORGANIC, N.O.S.
4.2	8	3126	SELF-HEATING SOLID, CORROSIVE, ORGANIC, N.O.S.
4.2	8	3185	SELF-HEATING LIQUID, CORROSIVE, ORGANIC, N.O.S.
4.2	8	3188	SELF-HEATING LIQUID, CORROSIVE, INORGANIC, N.O.S.
4.2	8	3192	SELF-HEATING SOLID, CORROSIVE, INORGANIC, N.O.S.
			Class 4.3
			Specific entries
4.3		1389	ALKALI METAL AMALGAM, LIQUID
4.3		1390	ALKALI METAL AMIDES
4.3		1391	ALKALI METAL DISPERSION or ALKALINE EARTH METAL DISPERSION
4.3		1392	ALKALINE EARTH METAL AMALGAM, LIQUID
4.3		1393	ALKALINE EARTH METAL ALLOY, N.O.S.
4.3		1409	METAL HYDRIDES, WATER-REACTIVE, N.O.S.
4.3		1421	ALKALI METAL ALLOY, LIQUID, N.O.S.
4.3		3208	METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.
4.3		3395	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE
4.3		3398	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE
4.3		3401	ALKALI METAL AMALGAM, SOLID
4.3		3402	ALKALINE EARTH METAL AMALGAM, SOLID
4.3	3	3399	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE
4.3	3	3482	ALKALI METAL DISPERSION, FLAMMABLE or ALKALINE EARTH METAL DISPERSION, FLAMMABLE
4.3	3 + 8	2988	CHLOROSILANES, WATER-REACTIVE, FLAMMABLE, CORROSIVE, N.O.S.
4.3	4.1	3396	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, FLAMMABLE
4.3	4.2	3209	METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.
4.3	4.2	3397	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, SELF-HEATING
			General entries
4.3		3148	WATER-REACTIVE LIQUID, N.O.S.
4.3		2813	WATER-REACTIVE SOLID, N.O.S.
4.3	4.1	3132	WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.
4.3	4.2	3135	WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.
4.3	5.1	3133	WATER-REACTIVE SOLID, OXIDIZING, N.O.S.
4.3	6.1	3130	WATER-REACTIVE LIQUID, TOXIC, N.O.S.
4.3	6.1	3134	WATER-REACTIVE SOLID, TOXIC, N.O.S.
4.3	8	3129	WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.
4.3	8	3131	WATER-REACTIVE SOLID, CORROSIVE, N.O.S.

Class or division	Subsidiary risk	UN Number	Proper Shipping Name
			CLASS 5
			Class 5.1
			Specific entries
5.1		1450	BROMATES, INORGANIC, N.O.S.
5.1		1461	CHLORATES, INORGANIC, N.O.S.
5.1		1462	CHLORITES, INORGANIC, N.O.S.
5.1		1477	NITRATES, INORGANIC, N.O.S.
5.1		1481	PERCHLORATES, INORGANIC, N.O.S.
5.1		1482	PERMANGANATES, INORGANIC, N.O.S.
5.1		1483	PEROXIDES, INORGANIC, N.O.S.
5.1		2627	NITRITES, INORGANIC, N.O.S.
5.1		3210	CHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.
5.1		3211	PERCHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.
5.1		3212	HYPOCHLORITES, INORGANIC, N.O.S.
5.1		3213	BROMATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.
5.1		3214	PERMANGANATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.
5.1		3215	PERSULPHATES, INORGANIC, N.O.S.
5.1		3216	PERSULPHATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.
5.1		3218	NITRATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.
5.1		3219	NITRITES, INORGANIC, AQUEOUS SOLUTION, N.O.S.
			General entries
5.1		1479	OXIDIZING SOLID, N.O.S.
5.1		3139	OXIDIZING LIQUID, N.O.S.
5.1	4.1	3137	OXIDIZING SOLID, FLAMMABLE, N.O.S.
5.1	4.2	3100	OXIDIZING SOLID, SELF-HEATING, N.O.S.
5.1	4.3	3121	OXIDIZING SOLID, WATER-REACTIVE, N.O.S.
5.1	6.1	3087	OXIDIZING SOLID, TOXIC, N.O.S.
5.1	6.1	3099	OXIDIZING LIQUID, TOXIC, N.O.S.
5.1	8	3085	OXIDIZING SOLID, CORROSIVE, N.O.S.
5.1	8	3098	OXIDIZING LIQUID, CORROSIVE, N.O.S.
			Class 5.2
			Specific entries
5.2		3101	ORGANIC PEROXIDE TYPE B, LIQUID
5.2		3102	ORGANIC PEROXIDE TYPE B, SOLID
5.2		3103	ORGANIC PEROXIDE TYPE C, LIQUID
5.2		3104	ORGANIC PEROXIDE TYPE C, SOLID
5.2		3105	ORGANIC PEROXIDE TYPE D, LIQUID
5.2		3106	ORGANIC PEROXIDE TYPE D, SOLID
5.2		3107	ORGANIC PEROXIDE TYPE E, LIQUID
5.2		3108	ORGANIC PEROXIDE TYPE E, SOLID
5.2		3109	ORGANIC PEROXIDE TYPE F, LIQUID
5.2		3110	ORGANIC PEROXIDE TYPE F, SOLID
5.2		3111	ORGANIC PEROXIDE TYPE B, LIQUID, TEMPERATURE CONTROLLED
5.2		3112	ORGANIC PEROXIDE TYPE B, SOLID, TEMPERATURE CONTROLLED
5.2		3113	ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED
5.2		3114	ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED
5.2		3115	ORGANIC PEROXIDE TYPE D, LIQUID, TEMPERATURE CONTROLLED
5.2		3116	ORGANIC PEROXIDE TYPE D, SOLID, TEMPERATURE CONTROLLED
5.2		3117	ORGANIC PEROXIDE TYPE E, LIQUID, TEMPERATURE CONTROLLED
5.2		3118	ORGANIC PEROXIDE TYPE E, SOLID, TEMPERATURE CONTROLLED
5.2		3119	ORGANIC PEROXIDE TYPE F, LIQUID, TEMPERATURE CONTROLLED
5.2		3120	ORGANIC PEROXIDE TYPE F, SOLID, TEMPERATURE CONTROLLED

Class or division	Subsidiary risk	UN Number	Proper Shipping Name
			CLASS 6
			Class 6.1
			Specific entries
6.1		1544	ALKALOIDS, SOLID, N.O.S. or ALKALOID SALTS, SOLID, N.O.S.
6.1		1549	ANTIMONY COMPOUND, INORGANIC, SOLID, N.O.S.
6.1		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		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		1564	BARIUM COMPOUND, N.O.S.
6.1		1566	BERYLLIUM COMPOUND, N.O.S.
6.1		1583	CHLOROPICRIN MIXTURE, N.O.S.
6.1		1588	CYANIDES, INORGANIC, SOLID, N.O.S.
6.1		1601	DISINFECTANT, SOLID, TOXIC, N.O.S.
6.1		1602	DYE, LIQUID, TOXIC, N.O.S. or DYE INTERMEDIATE, LIQUID, TOXIC, N.O.S.
6.1		1655	NICOTINE COMPOUND, SOLID, N.O.S. or NICOTINE PREPARATION, SOLID, N.O.S.
6.1		1693	TEAR GAS SUBSTANCE, LIQUID, N.O.S.
6.1		1707	THALLIUM COMPOUND, N.O.S.
6.1		1851	MEDICINE, LIQUID, TOXIC, N.O.S.
6.1		1935	CYANIDE SOLUTION, N.O.S.
6.1		2024	MERCURY COMPOUND, LIQUID, N.O.S.
6.1		2025	MERCURY COMPOUND, SOLID, N.O.S.
6.1		2026	PHENYLMERCURIC COMPOUND, N.O.S.
6.1		2206	ISOCYANATES, TOXIC, N.O.S. or ISOCYANATE SOLUTION, TOXIC, N.O.S.
6.1		2291	LEAD COMPOUND, SOLUBLE, N.O.S.
6.1		2570	CADMIUM COMPOUND
6.1		2788	ORGANOTIN COMPOUND, LIQUID, N.O.S.
6.1		2856	FLUOROSILICATES, N.O.S.
6.1		3140	ALKALOIDS, LIQUID, N.O.S or ALKALOIDS SALTS, LIQUID, N.O.S.
6.1		3141	ANTIMONY COMPOUND, INORGANIC, LIQUID, N.O.S.
6.1		3142	DISINFECTANT, LIQUID, TOXIC, N.O.S.
6.1		3143	DYE, SOLID, TOXIC, N.O.S. or DYE INTERMEDIATE, SOLID, TOXIC, N.O.S.
6.1		3144	NICOTINE COMPOUND, LIQUID, N.O.S. or NICOTINE PREPARATION, LIQUID, N.O.S.
6.1		3146	ORGANOTIN COMPOUND, SOLID, N.O.S.
6.1		3249	MEDICINE, SOLID, TOXIC, N.O.S.
6.1		3276	NITRILES, TOXIC, LIQUID, N.O.S.
6.1		3278	ORGANOPHOSPHORUS COMPOUND, TOXIC, LIQUID, N.O.S.
6.1		3280	ORGANOARSENIC COMPOUND, LIQUID, N.O.S.
6.1		3281	METAL CARBONYLS, LIQUID, N.O.S. with LC_{50}
6.1		3282	ORGANOMETALLIC COMPOUND, TOXIC, LIQUID, N.O.S. with LC_{50}
6.1		3283	SELENIUM COMPOUND, SOLID, N.O.S. with LC_{50}
6.1		3284	TELLURIUM COMPOUND, N.O.S. with LC_{50}
6.1		3285	VANADIUM COMPOUND, N.O.S.
6.1		3439	NITRILES, TOXIC, SOLID, N.O.S.
6.1		3440	SELENIUM COMPOUND, LIQUID, N.O.S.
6.1		3448	TEAR GAS SUBSTANCE, SOLID, N.O.S.
6.1		3462	TOXINS EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.
6.1		3464	ORGANOPHOSPHORUS COMPOUND, TOXIC, SOLID, N.O.S.
6.1		3465	ORGANOARSENIC COMPOUND, SOLID, N.O.S.
6.1		3466	METAL CARBONYLS, SOLID, N.O.S.
6.1		3467	ORGANOMETALLIC COMPOUND, TOXIC, SOLID, N.O.S.
6.1	3	3071	MERCAPTANS, LIQUID, TOXIC, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, TOXIC, FLAMMABLE, N.O.S.
6.1	3	3080	ISOCYANATES, TOXIC, FLAMMABLE, N.O.S or ISOCYANATE SOLUTION, TOXIC, FLAMMABLE, N.O.S.
6.1	3	3275	NITRILES, TOXIC, FLAMMABLE, N.O.S.
6.1	3	3279	ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE, N.O.S.
6.1	3 + 8	2742	CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.

Class or division	Subsidiary risk	UN Number	Proper Shipping Name
			CLASS 6 *(continued)*
			Class 6.1 *(continued)*
			Specific entries *(continued)*
6.1	3 + 8	3362	CHLOROSILANES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.
6.1	8	3277	CHLOROFORMATES, TOXIC, CORROSIVE, N.O.S.
6.1	8	3361	CHLOROSILANES, TOXIC, CORROSIVE, N.O.S.
			Pesticides
			(a) Solid
6.1		2588	PESTICIDE, SOLID, TOXIC, N.O.S.
6.1		2757	CARBAMATE PESTICIDE, SOLID, TOXIC
6.1		2759	ARSENICAL PESTICIDE, SOLID, TOXIC
6.1		2761	ORGANOCHLORINE PESTICIDE, SOLID, TOXIC
6.1		2763	TRIAZINE PESTICIDE, SOLID, TOXIC
6.1		2771	THIOCARBAMATE PESTICIDE, SOLID, TOXIC
6.1		2775	COPPER BASED PESTICIDE, SOLID, TOXIC
6.1		2777	MERCURY BASED PESTICIDE, SOLID, TOXIC
6.1		2779	SUBSTITUTED NITROPHENOL PESTICIDE, SOLID, TOXIC
6.1		2781	BIPYRIDILIUM PESTICIDE, SOLID, TOXIC
6.1		2783	ORGANOPHOSPHORUS PESTICIDE, SOLID, TOXIC
6.1		2786	ORGANOTIN PESTICIDE, SOLID, TOXIC
6.1		3027	COUMARIN DERIVATIVE PESTICIDE, SOLID, TOXIC
6.1		3345	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC
6.1		3349	PYRETHROID PESTICIDE, SOLID, TOXIC
			(b) Liquid
6.1		2902	PESTICIDE, LIQUID TOXIC, N.O.S.
6.1		2992	CARBAMATE PESTICIDE, LIQUID, TOXIC
6.1		2994	ARSENICAL PESTICIDE, LIQUID, TOXIC
6.1		2996	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC
6.1		2998	TRIAZINE PESTICIDE, LIQUID, TOXIC
6.1		3006	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC
6.1		3010	COPPER BASED PESTICIDE, LIQUID, TOXIC
6.1		3012	MERCURY BASED PESTICIDE, LIQUID, TOXIC
6.1		3014	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC
6.1		3016	BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC
6.1		3018	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC
6.1		3020	ORGANOTIN PESTICIDE, LIQUID, TOXIC
6.1		3026	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC
6.1		3348	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC
6.1		3352	PYRETHROID PESTICIDE, LIQUID, TOXIC
6.1	3	2903	PESTICIDE, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint $\geq$ 23°C
6.1	3	2991	CARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flashpoint $\geq$ 23°C
6.1	3	2993	ARSENICAL PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint $\geq$ 23°C
6.1	3	2995	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint $\geq$ 23°C
6.1	3	2997	TRIAZINE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flashpoint $\geq$ 23°C
6.1	3	3005	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint $\geq$ 23°C
6.1	3	3009	COPPER BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint $\geq$ 23°C
6.1	3	3011	MERCURY BASED PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint $\geq$ 23°C
6.1	3	3013	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint $\geq$ 23°C
6.1	3	3015	BIPYRIDILIUM PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint $\geq$ 23°C
6.1	3	3017	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint $\geq$ 23°C
6.1	3	3019	ORGANOTIN PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint $\geq$ 23°C
6.1	3	3025	COUMARIN DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint $\geq$ 23°C
6.1	3	3347	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint $\geq$ 23°C
6.1	3	3351	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE flashpoint $\geq$ 23°C

Class or division	Subsidiary risk	UN Number	Proper Shipping Name
			CLASS 6 *(continued)*
			Class 6.1 *(continued)*
			General entries
6.1		2810	TOXIC LIQUID, ORGANIC, N.O.S.
6.1		2811	TOXIC SOLID, ORGANIC, N.O.S.
6.1		3172	TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S.
6.1		3243	SOLIDS CONTAINING TOXIC LIQUID, N.O.S.
6.1		3287	TOXIC LIQUID, INORGANIC, N.O.S.
6.1		3288	TOXIC SOLID, INORGANIC, N.O.S.
6.1		3315	CHEMICAL SAMPLE, TOXIC
6.1		3381	TOXIC BY INHALATION LIQUID, N.O.S. with an LC_{50} lower than or equal to 200 mℓ/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}
6.1		3382	TOXIC BY INHALATION LIQUID, N.O.S. with an LC_{50} lower than or equal to 1000 mℓ/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}
6.1		3462	TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.
6.1	3	2929	TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.
6.1	3	3383	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an LC_{50} lower than or equal to 200 mℓ/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}
6.1	3	3384	TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an LC_{50} lower than or equal to 1000 mℓ/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}
6.1	3 + 8	3488	TOXIC BY INHALATION LIQUID, FLAMMABLE, CORROSIVE, N.O.S. with an LC_{50} lower than or equal to 200 mℓ/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}
6.1	3 + 8	3489	TOXIC BY INHALATION LIQUID, FLAMMABLE, CORROSIVE, N.O.S. with an LC_{50} lower than or equal to 1000 mℓ/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}
6.1	4.1	2930	TOXIC SOLID, FLAMMABLE, ORGANIC, N.O.S.
6.1	4.2	3124	TOXIC SOLID, SELF-HEATING, N.O.S.
6.1	4.3	3123	TOXIC LIQUID, WATER-REACTIVE, N.O.S.
6.1	4.3	3125	TOXIC SOLID, WATER-REACTIVE, N.O.S.
6.1	4.3	3385	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an LC_{50} lower than or equal to 200 mℓ/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}
6.1	4.3	3386	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an LC_{50} lower than or equal to 1000 mℓ/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}
6.1	4.3 + 3	3490	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S. with an LC_{50} lower than or equal to 200 mℓ/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}
6.1	4.3 + 3	3491	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE, N.O.S. with an LC_{50} lower than or equal to 1000 mℓ/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}
6.1	5.1	3122	TOXIC LIQUID, OXIDIZING, N.O.S.
6.1	5.1	3086	TOXIC SOLID, OXIDIZING, N.O.S.
6.1	5.1	3387	TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an LC_{50} lower than or equal to 200 mℓ/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}
6.1	5.1	3388	TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an LC_{50} lower than or equal to 1000 mℓ/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}
6.1	8	2927	TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S.
6.1	8	2928	TOXIC SOLID, CORROSIVE, ORGANIC, N.O.S.
6.1	8	3289	TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.
6.1	8	3290	TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.
6.1	8	3389	TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an LC_{50} lower than or equal to 200 mℓ/m^3 and saturated vapour concentration greater than or equal to 500 LC_{50}
6.1	8	3390	TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an LC_{50} lower than or equal to 1000 mℓ/m^3 and saturated vapour concentration greater than or equal to 10 LC_{50}

Class or division	Subsidiary risk	UN Number	Proper Shipping Name
			CLASS 6 *(continued)*
			Class 6.2
			Specific entries
6.2		3291	CLINICAL WASTE, UNSPECIFIED, N.O.S. or (BIO)MEDICAL WASTE, N.O.S. or REGULATED MEDICAL WASTE, N.O.S.
6.2		3373	BIOLOGICAL SUBSTANCE, CATEGORY B
			General entries
6.2		2814	INFECTIOUS SUBSTANCE, AFFECTING HUMANS
6.2		2900	INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only

Class or division	Subsidiary risk	UN Number	Proper Shipping Name
			CLASS 7
			General entries
7		2908	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – EMPTY PACKAGING
7		2909	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – ARTICLES MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or NATURAL THORIUM
7		2910	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – LIMITED QUANTITY OF MATERIAL
7		2911	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE – INSTRUMENTS or ARTICLES
7		2912	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) non fissile or fissile – excepted
7		2913	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II) non fissile or fissile – excepted
7		2915	RADIOACTIVE MATERIAL, TYPE A PACKAGE, non-special form, non fissile or fissile – excepted
7		2916	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE non fissile or fissile – excepted
7		2917	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE non fissile or fissile – excepted
7		2919	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT non fissile or fissile – excepted
7		3321	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), non fissile or fissile – excepted
7		3322	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III), non fissile or fissile – excepted
7		3323	RADIOACTIVE MATERIAL, TYPE C PACKAGE non fissile or fissile – excepted
7		3324	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), FISSILE
7		3325	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III), FISSILE
7		3326	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), FISSILE
7		3327	RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE non-special form
7		3328	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE
7		3329	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE
7		3330	RADIOACTIVE MATERIAL, TYPE C PACKAGE, FISSILE
7		3331	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, FISSILE
7		3332	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM non fissile or fissile – excepted
7		3333	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE

Class or division	Subsidiary risk	UN Number	Proper Shipping Name
			CLASS 8
			Specific entries
8		1719	CAUSTIC ALKALI LIQUID, N.O.S.
8		1740	HYDROGENDIFLUORIDES, SOLID, N.O.S.
8		1903	DISINFECTANT, LIQUID, CORROSIVE, N.O.S.
8		2430	ALKYLPHENOLS, SOLID, N.O.S. (including C_2–C_{12} homologues)
8		2693	BISULPHITES, AQUEOUS SOLUTION, N.O.S.
8		2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.
8		2801	DYE, LIQUID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, LIQUID, CORROSIVE, N.O.S.
8		2837	BISULPHATES, AQUEOUS SOLUTION
8		2987	CHLOROSILANES, CORROSIVE, N.O.S.
8		3145	ALKYLPHENOLS, LIQUID, N.O.S. (including C_2–C_{12} homologues)
8		3147	DYE, SOLID, CORROSIVE, N.O.S. or DYE INTERMEDIATE, SOLID, CORROSIVE, N.O.S.
8		3259	AMINES, SOLID, CORROSIVE, N.O.S. or POLYAMINES, SOLID, CORROSIVE, N.O.S.
8	3	2734	AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.
8	3	2986	CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S.
8	6.1	3471	HYDROGENDIFLUORIDES SOLUTION, N.O.S.
			General entries
8		1759	CORROSIVE SOLID, N.O.S.
8		1760	CORROSIVE LIQUID, N.O.S.
8		3244	SOLIDS CONTAINING CORROSIVE LIQUID, N.O.S.
8		3260	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.
8		3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.
8		3262	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S.
8		3263	CORROSIVE SOLID, BASIC, ORGANIC, N.O.S.
8		3264	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
8		3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
8		3266	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
8		3267	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.
8	3	2920	CORROSIVE LIQUID, FLAMMABLE, N.O.S.
8	4.1	2921	CORROSIVE SOLID, FLAMMABLE, N.O.S.
8	4.2	3095	CORROSIVE SOLID, SELF-HEATING, N.O.S.
8	4.2	3301	CORROSIVE LIQUID, SELF-HEATING, N.O.S.
8	4.3	3094	CORROSIVE LIQUID, WATER-REACTIVE, N.O.S.
8	4.3	3096	CORROSIVE SOLID, WATER-REACTIVE, N.O.S.
8	5.1	3084	CORROSIVE SOLID, OXIDIZING, N.O.S.
8	5.1	3093	CORROSIVE LIQUID, OXIDIZING, N.O.S.
8	6.1	2922	CORROSIVE LIQUID, TOXIC, N.O.S.
8	6.1	2923	CORROSIVE SOLID, TOXIC, N.O.S.

Class or division	Subsidiary risk	UN Number	Proper Shipping Name
			CLASS 9
			General entries
9		3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
9		3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
9		3245	GENETICALLY MODIFIED MICROORGANISMS or GENETICALLY MODIFIED ORGANISMS
9		3257	ELEVATED TEMPERATURE LIQUID, N.O.S. at or above 100°C and below its flashpoint (including molten metals, molten salts, etc.)
9		3258	ELEVATED TEMPERATURE SOLID, N.O.S., at or above 240°C
see SP960		3334	AVIATION REGULATED LIQUID, N.O.S.
see SP960		3335	AVIATION REGULATED SOLID, N.O.S.

Appendix B

Glossary of terms

Note: The provisions of this appendix are not mandatory.

Caution: The explanations in this glossary are for information only and are not to be used for purposes of hazard classification.

AIR BAG INFLATORS, PYROTECHNIC or AIR BAG MODULES, PYROTECHNIC or SEAT-BELT PRETENSIONERS, PYROTECHNIC	Articles which contain pyrotechnic substances and are used as life-saving vehicle air bags or seat-belts.
Ammunition	Generic term related mainly to articles of military application consisting of all kind of bombs, grenades, rockets, mines, projectiles and other similar devices or contrivances.
AMMUNITION, ILLUMINATING with or without burster, expelling charge or propelling charge	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. The term excludes the following articles which are listed separately: CARTRIDGES, SIGNAL; SIGNAL DEVICES, HAND; SIGNALS, DISTRESS; FLARES, AERIAL and FLARES, SURFACE.
AMMUNITION, INCENDIARY	Ammunition containing incendiary substances which may be a solid, liquid or gel including white phosphorus. 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. The term includes: AMMUNITION, INCENDIARY, liquid or gel, with burster, expelling charge or propelling charge; AMMUNITION, INCENDIARY with or without burster, expelling charge or propelling charge; AMMUNITION, INCENDIARY, WHITE PHOSPHORUS with burster, expelling charge or propelling charge.
AMMUNITION, PRACTICE	Ammunition without a main bursting charge, containing a burster or expelling charge. Normally it also contains a fuze and a propelling charge. The term excludes the following articles which are listed separately: GRENADES, PRACTICE.
AMMUNITION, PROOF	Ammunition containing pyrotechnic substances, used to test the performance or strength of new ammunition, weapon component or assemblies.

AMMUNITION, SMOKE	Ammunition containing smoke producing substance such as chlorosulphonic acid mixture, titanium tetrachloride or white phosphorus; or 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 but excludes SIGNALS, SMOKE which are listed separately. The term includes: AMMUNITION, SMOKE with or without burster, expelling charge or propelling charge; AMMUNITION, SMOKE, WHITE PHOSPHORUS with burster, expelling charge or propelling charge.
AMMUNITION, TEAR PRODUCING with burster, expelling charge or propelling charge	Ammunition containing 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.
AMMUNITION, TOXIC with burster, expelling charge or propelling charge	Ammunition containing toxic agent. 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)	Articles that contain only extremely insensitive substances and which demonstrate a negligible probability of accidental initiation or propagation (under normal conditions of transport) and which have passed Test Series 7.
ARTICLES, PYROPHORIC	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	Articles which contain pyrotechnic substances and are used for technical purposes such as heat generation, gas generation, theatrical effects, etc. The term excludes the following articles which are listed separately: 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, EXPLOSIVE; SIGNALS, SMOKE.
Auxiliary explosive component, isolated	An "isolated auxiliary explosive component" is a small device that explosively performs an operation related to the article's functioning, other than its main explosive loads' performance. Functioning of the component does not cause any reaction of the main explosive loads contained within the article.
BLACK POWDER (GUNPOWDER)	Substance consisting of an intimate mixture of charcoal or other carbon and either potassium nitrate or sodium nitrate, with or without sulphur. It may be meal, granular, compressed or pelletized.
Bombs	Explosive articles which are dropped from aircraft. They may contain a flammable liquid with bursting charge, a photo flash composition or a bursting charge. The term excludes torpedoes (aerial) and includes: BOMBS, PHOTO FLASH; BOMBS with bursting charge; BOMBS WITH FLAMMABLE LIQUID with bursting charge.

BOOSTERS	Articles consisting of a charge of detonating explosive with or without means of initiation. They are used to increase the initiating power of detonators or detonating cord.
BURSTERS, explosive	Articles consisting of a small charge of explosive used to open projectiles, or other ammunition in order to disperse their contents.
Cartridges, blank	Articles which consist of a cartridge case with a centre or rim fire primer and a confined charge of smokeless or black powder but no projectile. Used for training, saluting or in starter pistols, tools, etc.
CARTRIDGES, FLASH	Articles consisting of a casing, a primer and flash powder, all assembled in one piece ready for firing.
Cartridges for Weapons	(1) Fixed (assembled) or semi fixed (partially assembled) ammunition designed to be fired from weapons. Each cartridge includes all the components necessary to function the weapon once. The name and description shall be used for small arms cartridges that cannot be described as "cartridges, small arms". Separate loading ammunition is included under this name and description when the propelling charge and projectile are packed together (see also "Cartridges, blank"). (2) Incendiary, smoke, toxic and tear producing cartridges are described in this Glossary under AMMUNITION, INCENDIARY etc.
CARTRIDGES FOR WEAPONS, INERT PROJECTILE	Ammunition consisting of a projectile without bursting charge but with a propelling charge. The presence of a tracer can be disregarded for classification purposes provided that the predominant hazard is that of the propelling charge.
CARTRIDGES, OIL WELL	Articles consisting of a casing of thin fibre, metal or other material containing only propellant which projects a hardened projectile. The term excludes the following articles which are listed separately: CHARGES, SHAPED.
CARTRIDGES, POWER DEVICE	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, or linear or rotary motion, or activate diaphragms, valves or switches or project fastening devices or extinguishing agents.
CARTRIDGES, SIGNAL	Articles designed to fire coloured flares or other signals from signal pistols, etc.
CARTRIDGES, SMALL ARMS	Ammunition consisting of a cartridge case fitted with a centre or rim fire primer and containing both a propelling charge and a 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. The term excludes: CARTRIDGES, SMALL ARMS, BLANK listed separately in the Dangerous Goods List; and some small arms cartridges which are listed under CARTRIDGES FOR WEAPONS, INERT PROJECTILE.
CASES, CARTRIDGE, EMPTY, WITH PRIMER	Articles consisting of a cartridge case made from metal, plastics or other non flammable material, in which the only explosive component is the primer.
CASES, COMBUSTIBLE, EMPTY, WITHOUT PRIMER	Articles consisting of cartridge cases made partly or entirely from nitrocellulose.

Charges, bursting	Articles consisting of a charge of detonating explosive such as hexolite, octolite or plastics bonded explosive designed to produce effect by blast or fragmentation.
CHARGES, DEMOLITION	Articles containing a charge of a detonating explosive in a casing of fibreboard, plastics, metal or other material. The term excludes the following articles which are listed separately: bombs, mines, etc.
CHARGES, DEPTH	Articles consisting of a charge of detonating explosive contained in a drum or projectile. They are designed to detonate under water.
Charges, expelling	A charge of deflagrating explosive designed to eject the payload from the parent articles without damage.
CHARGES, EXPLOSIVE, COMMERCIAL without detonator	Articles consisting of a charge of detonating explosive without means of initiation, used for explosive welding, jointing, forming and other metallurgical processes.
CHARGES, PROPELLING	Articles consisting of a propellant charge in any physical form, with or without a casing, for use as a component of rocket motors or for reducing the drag of projectiles.
CHARGES, PROPELLING FOR CANNON	Articles consisting of a propellant charge in any physical form, with or without a casing, for use in a cannon.
CHARGES, SHAPED, without detonator	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	Articles consisting of a V-shaped core of a detonating explosive clad by a flexible metal sheath.
CHARGES, SUPPLEMENTARY, EXPLOSIVE	Articles consisting of a small removable booster used in the cavity of a projectile between the fuze and the bursting charge.
COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	Articles containing an explosive designed to transmit the detonation or deflagration within an explosive train.
CONTRIVANCES, WATER ACTIVATED with burster, expelling charge or propelling charge	Articles whose functioning depends upon physico chemical reaction of their contents with water.
CORD, DETONATING, flexible	Article consisting of a core of detonating explosive enclosed in spun fabric, with plastics or other covering unless the spun fabric is sift proof.
CORD (FUSE), DETONATING, metal clad	Article consisting of a core of detonating explosive clad by a soft metal tube with or without protective covering. When the core contains a sufficiently small quantity of explosive, the words “MILD EFFECT” are added.
CORD, IGNITER	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	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	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. Other detonating relays are included in “Detonators, non electric”.

Detonators	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. They may be constructed to detonate instantaneously, or may contain a delay element. The term includes: DETONATORS FOR AMMUNITION and DETONATORS for blasting, both ELECTRIC and NON ELECTRIC. Detonating relays without flexible detonating cord are included.
Entire load and total contents	The phrases "entire load" and "total contents" mean such a substantial proportion that the practical hazard shall be assessed by assuming simultaneous explosion of the whole of the explosive content of the load or package.
Explode	The verb used to indicate those explosive effects capable of endangering life and property through blast, heat and projection of missiles. It encompasses both deflagration and detonation.
Explosion of the total contents	The phrase "explosion of the total contents" is used in testing a single article or package or a small stack of articles or packages.
Explosive, blasting	Detonating explosive substances used in mining, construction and similar tasks. Blasting explosives are assigned to one of five types. In addition to the ingredients listed, blasting explosives may also contain inert components such as kieselguhr, and minor ingredients such as colouring agents and stabilizers.
EXPLOSIVE, BLASTING, TYPE A	Substances consisting of liquid organic nitrates such as nitroglycerin 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. Such explosives shall be in powdery, gelatinous or elastic form. The term includes dynamite gelatine, blasting and gelatine dynamites.
EXPLOSIVE, BLASTING, TYPE B	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. Such explosives shall not contain nitroglycerin, similar liquid organic nitrates, or chlorates.
EXPLOSIVE, BLASTING, TYPE C	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. Such explosives shall not contain nitroglycerin or similar liquid organic nitrates.
EXPLOSIVE, BLASTING, TYPE D	Substances consisting of a mixture of organic nitrated compounds and combustible materials such as hydrocarbons and aluminium powder. Such explosives shall not contain nitroglycerin, similar liquid organic nitrates, chlorates or ammonium nitrate. The term generally includes plastic explosives.

EXPLOSIVE, BLASTING, TYPE E	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. The term includes explosives, emulsion; explosives slurry and explosives, water gel.
Explosive, deflagrating	A substance which reacts by detonation rather than deflagration when initiated and used in its normal manner.
Explosive, extremely insensitive substance (EIS)	A substance which has demonstrated through tests that it is so insensitive that there is very little probability of accidental initiation.
Explosive, primary	Explosive substance manufactured with a view to producing a practical effect by explosion which is very sensitive to heat, impact or friction and which, even in very small quantities, either detonates or burns very rapidly. It is able to transmit detonation (in the case of initiating explosive) or deflagration to secondary explosives close to it. The main primary explosives are mercury fulminate, lead azide and lead styphnate.
Explosive, secondary	Explosive substance which is relatively insensitive (when compared to primary explosives), which is usually initiated by primary explosives with or without the aid of boosters or supplementary charges. Such an explosive may react as a deflagrating or as a detonating explosive.
FIREWORKS	Pyrotechnic articles designed for entertainment.
Flares	Articles containing pyrotechnic substances which are designed for use to illuminate, identify, signal or warn. The term includes: FLARES, AERIAL; FLARES, SURFACE.
FLASH POWDER	Pyrotechnic substance which, when ignited, produces an intense light.
FRACTURING DEVICES, EXPLOSIVE for oil wells, without detonator	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/Fuze (English text only)	Although these two words have a common origin (French fusée, fusil) and are sometimes considered to be different spellings, it is useful to maintain the convention that fuse refers to a cord like igniting device whereas fuze refers to a device used in ammunition which incorporates mechanical, electrical, chemical or hydrostatic components to initiate a train by deflagration or detonation.
FUSE, IGNITER, tubular, metal clad	Article consisting of a metal tube with a core of deflagrating explosive.
FUSE, INSTANTANEOUS, NON DETONATING (QUICKMATCH)	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	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

Articles designed to start a detonation or a deflagration in ammunition. They incorporate mechanical, electrical, chemical or hydrostatic components and generally protective features. The term includes:

FUZES, DETONATING;

FUZES, DETONATING with protective features;

FUZES, IGNITING.

GRENADES, hand or rifle

Articles which are designed to be thrown by hand or to be projected by a rifle. The term includes:

GRENADES, hand or rifle, with bursting charge;

GRENADES, PRACTICE, hand or rifle.

The term excludes grenades, smoke which are listed under AMMUNITION, SMOKE.

IGNITERS

Articles containing one or more explosive substances used to start deflagration in an explosive train. They may be actuated chemically, electrically or mechanically. This term excludes the following articles which are listed separately: CORD, IGNITER; FUSE, IGNITER; FUSE, NON DETONATING; FUZES, IGNITING; LIGHTERS, FUSE; PRIMERS, CAP TYPE; PRIMERS, TUBULAR.

Ignition, means of

A general term used in connection with the method employed to ignite a deflagrating train of explosive or pyrotechnic substances (for example: a primer for a propelling charge; an igniter for a rocket motor; an igniting fuze).

Initiation, means of

(1) A device intended to cause the detonation of an explosive (for example: detonator; detonator for ammunition; detonating fuze).

(2) The term “with its own means of initiation” means that the contrivance has its normal initiating device assembled to it and this device is considered to present a significant risk during transport but not one great enough to be unacceptable. The term does not apply, however, to a contrivance packed together with its means of initiation provided the device is packaged so as to eliminate the risk of causing detonation of the contrivance in the event of accidental functioning of the initiating device. The means of initiating can even be assembled to the contrivance provided there are protective features such that the device is very unlikely to cause detonation of the contrivance in conditions which are associated with transport.

(3) For the purposes of classification any means of initiation without two effective protective features shall be regarded as Compatibility Group B; an article with its own means of initiation, without two effective protective features, would be Compatibility Group F. On the other hand a means of initiation which itself possesses two effective protective features would be Compatibility Group D; and an article with a means of initiation which possesses two effective protective features would be Compatibility Group D or E. Means of initiation adjudged as having two effective protective features shall have been approved by the competent national authority. A common and effective way of achieving the necessary degree of protection is to use a means of initiation which incorporates two or more independent safety features.

JET PERFORATING GUNS, CHARGED, oil well, without detonator	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	Articles of various design actuated by friction, percussion or electricity and used to ignite safety fuse.
Mass explosion	Explosion which affects almost the entire load virtually instantaneously.
MINES	Articles consisting normally of metal or composition receptacles and a bursting charge. They are designed to be operated by the passage of ships, vehicles or personnel. The term includes "Bangalore torpedoes".
OXYGEN GENERATORS, CHEMICAL	Oxygen generators, chemical, are devices containing chemicals which upon activation releases oxygen as a product of chemical reaction. Chemical oxygen generators are used for the generation of oxygen for respiratory support, e.g. in aircraft, submarines, spacecraft, bomb shelters and breathing apparatus. Oxidizing salts such as chlorates and perchlorates of lithium, sodium and potassium, which are used in chemical oxygen generators, evolve oxygen when heated. These salts are mixed (compounded) with a fuel, usually iron powder, to form a chlorate candle, which produces oxygen by continuous reaction. The fuel is used to generate heat by oxidation. Once the reaction begins, oxygen is released from the hot salt by thermal decomposition (a thermal shield is used around the generator). A portion of the oxygen reacts with the fuel to produce more heat which produces more oxygen, and so on. Initiation of the reaction can be achieved by a percussion device, friction device or electric wire.
POWDER CAKE (POWDER PASTE), WETTED	Substance consisting of nitrocellulose impregnated with not more than 60% of nitroglycerin or other liquid organic nitrates or a mixture of these.
POWDER, SMOKELESS	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 nitroglycerin (NG)) and those with a triple base (such as NC/NG/nitroguanidine). Cast, pressed or bag charges of smokeless powder are listed under "CHARGES, PROPELLING" or "CHARGES, PROPELLING FOR CANNON".
PRIMERS, CAP TYPE	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	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	Articles such as a shell or bullet which are projected from a cannon or other artillery gun, rifle or other small arm. They may be inert, with or without tracer, or may contain a burster or expelling charge or a bursting charge. The term includes: PROJECTILES, inert, with tracer; PROJECTILES with burster or expelling charge; PROJECTILES with bursting charge.

PROPELLANTS	Deflagrating explosive used for propulsion or for reducing the drag of projectiles.
PROPELLANTS, LIQUID	Substances consisting of a deflagrating liquid explosive, used for propulsion.
PROPELLANTS, SOLID	Substances consisting of a deflagrating solid explosive, used for propulsion.
RELEASE DEVICES, EXPLOSIVE	Articles consisting of a small charge of explosive with means of initiation. They sever rods or links to release equipment quickly.
ROCKET MOTORS	Articles consisting of a solid, liquid or hypergolic fuel contained in a cylinder fitted with one or more nozzles. They are designed to propel a rocket or a guided missile. The term includes: ROCKET MOTORS; ROCKET MOTORS WITH HYPERGOLIC LIQUIDS with or without expelling charge; ROCKET MOTORS, LIQUID FUELLED.
ROCKETS	Articles consisting of a rocket motor and a payload which may be an explosive warhead or other device. The term includes guided missiles and: ROCKETS, LINE THROWING; ROCKETS, LIQUID FUELLED with bursting charge; ROCKETS with bursting charge; ROCKETS with expelling charge; ROCKETS with inert head.
SIGNALS	Articles containing pyrotechnic substances designed to produce signals by means of sound, flame or smoke or any combinations thereof. The term includes: SIGNAL DEVICES, HAND; SIGNALS, DISTRESS, ship; SIGNALS, RAILWAY TRACK, EXPLOSIVE; SIGNALS, SMOKE.
SOUNDING DEVICES, EXPLOSIVE	Articles consisting of a charge of detonating explosive. They are dropped from ships and function when they reach a predetermined depth or the sea bed.
STABILIZED	Stabilized means that the substance is in a condition that precludes uncontrolled reaction. This may be achieved by methods such as the addition of an inhibiting chemical, degassing the substance to remove dissolved oxygen and inerting the air space in the package, or maintaining the substance under temperature control.
SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE (SUBSTANCES, EVI), N.O.S.	Substances which present 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	Articles containing an explosive or non explosive propulsion system and designed to be propelled through water. They may contain an inert head or a warhead. The term includes: TORPEDOES, LIQUID FUELLED with inert head; TORPEDOES, LIQUID FUELLED with or without bursting charge; TORPEDOES with bursting charge.

TRACERS FOR AMMUNITION	Sealed articles containing pyrotechnic substances, designed to reveal the trajectory of a projectile.
Warheads	Articles consisting of detonating explosives. They are designed to be fitted to a rocket, guided missile or torpedo. They may contain a burster or expelling charge or bursting charge. The term includes: WARHEADS, ROCKET with burster or expelling charge; WARHEADS, ROCKET with bursting charge; WARHEADS, TORPEDO with bursting charge.

PART 4

PACKING AND TANK PROVISIONS

Chapter 4.1

Use of packagings, including intermediate bulk containers (IBCs) and large packagings

4.1.0 Definitions

Effectively closed: liquid-tight closure.

Hermetically sealed: vapour-tight closure.

Securely closed: so closed that dry contents cannot escape during normal handling; the minimum provisions for any closure.

4.1.1 General provisions for the packing of dangerous goods in packagings, including IBCs and large packagings

Note: For the packing of goods of classes 2, 6.2 and 7, the general provisions of this section only apply as indicated in 4.1.8.2 (class 6.2), 4.1.9.1.5 (class 7) and in the applicable packing instructions of 4.1.4 (P201 and LP02 for class 2 and P620, P621, P650, IBC620 and LP621 for class 6.2).

4.1.1.1 Dangerous goods shall be packed in good quality packagings, including IBCs and large packagings, which shall be strong enough to withstand the shocks and loadings normally encountered during transport, including trans-shipment between cargo transport units and between cargo transport units and warehouses as well as any removal from a pallet or overpack for subsequent manual or mechanical handling. Packagings, including IBCs and large packagings, shall be constructed and closed so as to prevent any loss of contents when prepared for transport which may be caused under normal conditions of transport, by vibration, or by changes in temperature, humidity or pressure (resulting from altitude, for example). Packagings, including IBCs and large packagings, shall be closed in accordance with the information provided by the manufacturer. No dangerous residue shall adhere to the outside of packages, IBCs and large packagings during transport. These provisions apply, as appropriate, to new, re-used, reconditioned or remanufactured packagings, and to new, re-used, repaired or remanufactured IBCs, and to new, re-used or remanufactured large packagings.

4.1.1.2 Parts of packagings, including IBCs and large packagings, which are in direct contact with dangerous goods:

.1 shall not be affected or significantly weakened by those dangerous goods; and

.2 shall not cause a dangerous effect, such as catalysing a reaction or reacting with the dangerous goods;

.3 shall not allow permeation of the dangerous goods that could constitute a danger under normal conditions of transport.

Where necessary, they shall be provided with a suitable inner coating or treatment.

4.1.1.3 Unless otherwise provided elsewhere in this Code, each packaging, including IBCs and large packagings, except inner packagings, shall conform to a design type successfully tested in accordance with the provisions of 6.1.5, 6.3.2, 6.5.4 or 6.6.5, as applicable. However, IBCs manufactured before 1 January 2011 and conforming to a design type which has not passed the vibration test of 6.5.6.13 or which was not required to meet the criteria of 6.5.6.9.5.4 at the time it was subjected to the drop test may still be used.

4.1.1.4 When filling packagings, including IBCs and large packagings, with liquids,* sufficient ullage (outage) shall be left to ensure that neither leakage nor permanent distortion of the packaging occurs as a result of an expansion of the liquid caused by temperatures likely to occur during transport. Unless specific provisions are prescribed, liquids shall not completely fill a packaging at a temperature of 55°C. However, sufficient ullage

* With respect to ullage limits only, the provisions applicable for packagings for solid substances may be used if the viscous substance has an outflow time via a DIN-cup with a 4 mm diameter outlet exceeding 10 minutes at 20°C (corresponding to an outflow time via a Ford cup 4 of more than 690 seconds at 20°C, or to a viscosity of more than 2680 centistokes at 20°C).

shall be left in an IBC to ensure that at the mean bulk temperature of 50°C it is not filled to more than 98% of its water capacity.*

4.1.1.4.1 For air transport, packagings intended to contain liquids shall also be capable of withstanding a pressure differential without leakage as specified in the international regulations for air transport.

4.1.1.5 Inner packagings shall be packed in an outer packaging in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the outer packaging. Inner packagings containing liquids shall be packaged with their closures upward and placed within outer packagings consistent with the orientation markings prescribed in 5.2.1.7 of this Code. Inner packagings that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials, etc., shall be secured in outer packagings with suitable cushioning material. Any leakage of the contents shall not substantially impair the protective properties of the cushioning material or of the outer packaging.

4.1.1.5.1 Where an outer packaging of a combination packaging or a large packaging has been successfully tested with different types of inner packagings, a variety of such different inner packagings may also be assembled in this outer packaging or large packagings. In addition, provided an equivalent level of performance is maintained, the following variations in inner packagings are allowed without further testing of the package:

.1 Inner packagings of equivalent or smaller size may be used provided:

- the inner packagings are of similar design to the tested inner packagings (such as shape – round, rectangular, etc.);
- the material of construction of inner packagings (glass, plastics, metal, etc.) offers resistance to impact and stacking forces equal to or greater than that of the originally tested inner packaging;
- the inner packagings have the same or smaller openings and the closure is of similar design (such as screw cap, friction lid, etc.);
- sufficient additional cushioning material is used to take up void spaces and to prevent significant movement of the inner packagings;
- inner packagings are oriented within the outer packaging in the same manner as in the tested package; and

.2 A lesser number of the tested inner packagings or of the alternative types of inner packagings identified in .1 above may be used, provided sufficient cushioning is added to fill the void space(s) and to prevent significant movement of the inner packagings.

4.1.1.5.2 Cushioning and absorbent material shall be inert and suited to the nature of the contents.

4.1.1.5.3 The nature and the thickness of the outer packagings shall be such that friction during transport does not generate any heating likely to alter dangerously the chemical stability of the contents.

4.1.1.6 Dangerous goods shall not be packed together in the same outer packaging, or in large packagings, with dangerous or other goods if they react dangerously with each other and cause:

.1 combustion and/or evolution of considerable heat;

.2 evolution of flammable, toxic or asphyxiant gases;

.3 the formation of corrosive substances; or

.4 the formation of unstable substances.

4.1.1.7 The closures of packagings containing wetted or diluted substances shall be such that the percentage of liquid (water, solvent or phlegmatizer) does not fall below the prescribed limits during transport.

4.1.1.7.1 Where two or more closure systems are fitted in series on an IBC, that nearest to the substance being transported shall be closed first.

4.1.1.7.2 Unless otherwise specified in the Dangerous Goods List, packages containing substances which:

.1 evolve flammable gases or vapour;

.2 may become explosive if allowed to dry;

.3 evolve toxic gases or vapour;

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* For a differing temperature, the maximum degree of filling may be determined as follows:

$$\text{Degree of filling} = \frac{98}{1 + \alpha\,(50 - t_F)} \text{ per cent of the capacity of the IBC}$$

In this formula α represents the mean coefficient of cubic expansion of the liquid substance between 15°C and 50°C; that is to say, for a maximum rise in the temperature of 35°C, "α" is calculated according to the formula:

$$\alpha = \frac{d_{15} - d_{50}}{35 \times d_{50}}$$

where d_{15} and d_{50} are the relative densities of the liquid at 15°C and 50°C and t_F is the mean temperature of the liquid at the time of filling.

.4 evolve corrosive gases or vapour; or

.5 may react dangerously with the atmosphere

should be hermetically sealed.

4.1.1.8 Where pressure may develop in a package by the emission of gas from the contents (as a result of temperature increase or other causes), the packaging or IBC may be fitted with a vent provided that the gas emitted will not cause danger on account of its toxicity, its flammability, the quantity released, etc.

A venting device shall be fitted if dangerous overpressure may develop due to normal decomposition of substances. The vent shall be so designed that, when the packaging or IBC is in the attitude in which it is intended to be transported, leakages of liquid and the penetration of foreign substances are prevented under normal conditions of transport.

4.1.1.8.1 Liquids may only be filled into inner packagings which have an appropriate resistance to internal pressure that may be developed under normal conditions of transport.

4.1.1.9 New, remanufactured or re-used packagings, including IBCs and large packagings, or reconditioned packagings and repaired or routinely maintained IBCs shall be capable of passing the tests prescribed in 6.1.5, 6.3.5, 6.5.6 or 6.6.5, as applicable. Before being filled and handed over for transport, every packaging, including IBCs and large packagings, shall be inspected to ensure that it is free from corrosion, contamination or other damage and every IBC shall be inspected with regard to the proper functioning of any service equipment. Any packaging which shows signs of reduced strength as compared with the approved design type shall no longer be used or shall be so reconditioned that it is able to withstand the design type tests. Any IBC which shows signs of reduced strength as compared with the tested design type shall no longer be used or shall be so repaired or routinely maintained that it is able to withstand the design type tests.

4.1.1.10 Liquids shall be filled only into packagings, including IBCs, which have an appropriate resistance to the internal pressure that may develop under normal conditions of transport. As the vapour pressure of low-boiling-point liquids is usually high, the strength of receptacles for these liquids shall be sufficient to withstand, with an ample factor of safety, the internal pressure likely to be generated. Packagings and IBCs marked with the hydraulic test pressure prescribed in 6.1.3.1(d) and 6.5.2.2.1, respectively, shall be filled only with a liquid having a vapour pressure:

.1 such that the total gauge pressure in the packaging or IBC (i.e. the vapour pressure of the filling substance plus the partial pressure of air or other inert gases, less 100 kPa) at 55°C, determined on the basis of a maximum degree of filling in accordance with 4.1.1.4 and a filling temperature of 15°C, will not exceed two thirds of the marked test pressure; or

.2 at 50°C, less than four sevenths of the sum of the marked test pressure plus 100 kPa; or

.3 at 55°C, less than two thirds of the sum of the marked test pressure plus 100 kPa.

IBCs intended for the transport of liquids shall not be used to carry liquids having a vapour pressure of more than 110 kPa (1.1 bar) at 50°C or 130 kPa (1.3 bar) at 55°C.

Examples of required marked test pressures for packagings, including IBCs, calculated as in 4.1.1.10.3

UN No.	Name	Class	Packing group	Vp_{55} (kPa)	$Vp_{55}\times1.5$ (kPa)	($Vp_{55}\times1.5$) minus 100 (kPa)	Required minimum test pressure (gauge) under 6.1.5.5.4.3 (kPa)	Minimum test pressure (gauge) to be marked on the packaging (kPa)
2056	Tetrahydrofuran	3	I	70	105	5	100	100
2247	*n*-Decane	3	II	1.4	2.1	–97.9	100	100
1593	Dichloromethane	6.1	III	164	246	146	146	150
1155	Diethyl ether	3	I	199	299	199	199	250

Note 1: For pure liquids, the vapour pressure at 55°C (Vp_{55}) can often be obtained from scientific tables.

Note 2: The table refers to the use of 4.1.1.10.3 only, which means that the marked test pressure shall exceed 1.5 times the vapour pressure at 55°C less 100 kPa. When, for example, the test pressure for *n*-decane is determined according to 6.1.5.5.4.1, the minimum marked test pressure may be lower.

Note 3: For diethyl ether, the required minimum test pressure under 6.1.5.5.5 is 250 kPa.

4.1.1.11 Empty packagings, including IBCs and large packagings, that have contained a dangerous substance shall be treated in the same manner as is required by this Code for a filled packaging, unless adequate measures have been taken to nullify any hazard.

4.1.1.12 Every packaging, as specified in chapter 6.1, intended to contain liquids shall successfully undergo a suitable leakproofness test, and be capable of meeting the appropriate test level indicated in 6.1.5.4.4:

.1 before it is first used for transport;

.2 after remanufacturing or reconditioning of any packaging, before it is re-used for transport.

For this test, the packaging need not have its closures fitted. The inner receptacle of a composite packaging may be tested without the outer packaging, provided the test results are not affected. This test is not necessary for inner packagings of combination packagings or large packagings.

4.1.1.13 Packagings, including IBCs, used for solids which may become liquid at temperatures likely to be encountered during transport shall also be capable of containing the substance in the liquid state.

4.1.1.14 Packagings, including IBCs, used for powdery or granular substances shall be sift-proof or shall be provided with a liner.

4.1.1.15 For plastics drums and jerricans, rigid plastics IBCs and composite IBCs with plastics inner receptacles, unless otherwise approved by the competent authority, the period of use permitted for the transport of dangerous substances shall be five years from the date of manufacture of the receptacles, except where a shorter period of use is prescribed because of the nature of the substance to be transported.

4.1.1.16 Where ice is used as a coolant it shall not affect the integrity of the packaging.

4.1.1.17 **Explosives, self-reactive substances and organic peroxides**

Unless specific provision to the contrary is made in this Code, the packagings, including IBCs and large packagings, used for goods of class 1, self-reactive substances of class 4.1 and organic peroxides of class 5.2 shall comply with the provisions for the medium danger group (packing group II).

4.1.1.18 **Use of salvage packagings**

4.1.1.18.1 Damaged, defective, leaking or non-conforming packages, or dangerous goods that have spilled or leaked may be transported in salvage packagings mentioned in 6.1.5.1.11. This does not prevent the use of a bigger size packaging of appropriate type and performance level under the conditions of 4.1.1.18.2.

4.1.1.18.2 Appropriate measures shall be taken to prevent excessive movement of the damaged or leaking packages within a salvage packaging. When the salvage packaging contains liquids, sufficient inert absorbent material shall be added to eliminate the presence of free liquid.

4.1.1.18.3 Appropriate measures shall be taken to ensure there is no dangerous build-up of pressure.

4.1.1.18.4 In addition to the general provisions of the Code, the following paragraphs apply specifically to salvage packagings: 5.2.1.3, 5.4.1.5.3, 6.1.2.4, 6.1.5.1.11 and 6.1.5.7.

4.1.1.19 **Use of salvage pressure receptacles**

4.1.1.19.1 In the case of damaged, defective, leaking or non-conforming pressure receptacles, salvage pressure receptacles according to 6.2.3 may be used.

Note: A salvage pressure receptacle may be used as an overpack in accordance with 5.1.2. When used as an overpack, markings shall be in accordance with 5.1.2.1 instead of 5.2.1.3.

4.1.1.19.2 Pressure receptacles shall be placed in salvage pressure receptacles of suitable size. More than one pressure receptacle may be placed in the same salvage pressure receptacle only if the contents are known and do not react dangerously with each other (see 4.1.1.6). Measures shall be taken to prevent movement of the pressure receptacles within the salvage pressure receptacle, e.g., by partitioning, securing or cushioning.

4.1.1.19.3 A pressure receptacle may only be placed in a salvage pressure receptacle if:

.1 The salvage pressure receptacle is in accordance with 6.2.3.5 and a copy of the approval certificate is available;

.2 Parts of the salvage pressure receptacle which are, or are likely to be in direct contact with the dangerous goods will not be affected or weakened by those dangerous goods and will not cause a dangerous effect (e.g., catalyzing reaction or reacting with the dangerous goods); and

.3 The contents of the contained pressure receptacle(s) is limited in pressure and volume so that if totally discharged into the salvage pressure receptacle, the pressure in the salvage pressure receptacle at 65°C will not exceed the test pressure of the salvage pressure receptacle (for gases, see packing instruction in P200 (3) 4.1.4.1). The reduction of the useable water capacity of the salvage pressure receptacle, e.g., by any contained equipment and cushioning, shall be taken into account.

4.1.1.19.4 The proper shipping name, the UN Number preceded by the letters "UN" and label(s) as required for packages in Chapter 5.2 applicable to the dangerous goods inside the contained pressure receptacle(s) shall be applied to the salvage pressure receptacle for transport.

4.1.1.19.5 Salvage pressure receptacles shall be cleaned, purged and visually inspected internally and externally after each use. They shall be periodically inspected and tested in accordance with 6.2.1.6 at least once every five years.

4.1.1.20 During transport, packagings, including IBCs and large packagings, shall be securely fastened to or contained within the cargo transport unit, so that lateral or longitudinal movement or impact is prevented and adequate external support is provided.

4.1.2 Additional general provisions for the use of IBCs

4.1.2.1 When IBCs are used for the transport of liquids with a flashpoint of 60°C (closed cup) or lower, or of powders liable to dust explosion, measures shall be taken to prevent a dangerous electrostatic discharge.

4.1.2.2.1 Every metal, rigid plastics and composite IBC shall be inspected and tested, as relevant, in accordance with 6.5.4.4 or 6.5.4.5:

.1 before it is put into service;

.2 thereafter at intervals not exceeding two and a half and five years, as appropriate; and

.3 after the repair or remanufacture, before it is re-used for transport.

4.1.2.2.2 An IBC shall not be filled and offered for transport after the date of expiry of the last periodic test or inspection. However, an IBC filled prior to the date of expiry of the last periodic test or inspection may be transported for a period not to exceed three months beyond the date of expiry of the last periodic test or inspection. In addition, an IBC may be transported after the date of expiry of the last periodic test or inspection:

.1 after emptying but before cleaning, for purposes of performing the required test or inspection prior to refilling; and

.2 unless otherwise approved by the competent authority, for a period not to exceed six months beyond the date of expiry of the last periodic test or inspection in order to allow the return of dangerous goods or residues for proper disposal or recycling. Reference to this exemption shall be entered in the transport document.

4.1.2.3 IBCs of type 31HZ2 when transporting liquids shall be filled to at least 80% of the volume of the outer casing and shall be transported in closed cargo transport units.

4.1.2.4 Except for routine maintenance of metal, rigid plastics, composite and flexible IBCs performed by the owner of the IBC, whose State and name or authorized symbol is durably marked on the IBC, the party performing routine maintenance shall durably mark the IBC near the manufacturer's UN design type marking to show:

.1 the State in which the routine maintenance was carried out; and

.2 the name or authorized symbol of the party performing the routine maintenance.

4.1.3 General provisions concerning packing instructions

4.1.3.1 Packing instructions applicable to dangerous goods of classes 1 to 9 are specified in 4.1.4. They are subdivided in three sub-sections depending on the type of packagings to which they apply:

sub-section 4.1.4.1 for packagings other than IBCs and large packagings; these packing instructions are designated by an alphanumeric code comprising the letter "P";

sub-section 4.1.4.2 for IBCs; these are designated by an alphanumeric code comprising the letters "IBC";

sub-section 4.1.4.3 for large packagings; these are designated by an alphanumeric code comprising the letters "LP".

Generally, packing instructions specify that the general provisions of 4.1.1, 4.1.2 and/or 4.1.3, as appropriate, are applicable. They may also require compliance with the special provisions of 4.1.5, 4.1.6, 4.1.7, 4.1.8 or 4.1.9 when appropriate. Special packing provisions may also be specified in the packing instruction for individual substances or articles. They are also designated by an alphanumeric code comprising the letters:

"PP" for packagings other than IBCs and large packagings

"B" for IBCs

"L" for large packagings.

Unless otherwise specified, each packaging shall conform to the applicable provisions of part 6. Generally, packing instructions do not provide guidance on compatibility and the user shall not select a packaging

without checking that the substance is compatible with the packaging material selected (such as, most fluorides are unsuitable for glass receptacles). Where glass receptacles are permitted in the packing instructions, porcelain, earthenware and stoneware packagings are also allowed.

4.1.3.2 Column 8 of the Dangerous Goods List shows for each article or substance the packing instruction(s) that shall be used. Column 9 indicates the special packing provisions applicable to specific substances or articles.

4.1.3.3 Each packing instruction shows, where applicable, the acceptable single and combination packagings. For combination packagings, the acceptable outer packagings, inner packagings and, when applicable, the maximum quantity permitted in each inner or outer packaging are shown. *Maximum net mass* and *maximum capacity* are as defined in 1.2.1.

4.1.3.4 The following packagings shall not be used when the substances being transported are liable to become liquid during transport:

Packagings

Drums: 1D and 1G

Boxes: 4C1, 4C2, 4D, 4F, 4G and 4H1

Bags: 5L1, 5L2, 5L3, 5H1, 5H2, 5H3, 5H4, 5M1 and 5M2

Composite: 6HC, 6HD1, 6HD2, 6HG1, 6HG2, 6PC, 6PD1, 6PD2, 6PG1, 6PG2 and 6PH1

Large *packagings*

Flexible plastics: 51H (outer packaging)

IBCs

For substances of packing group I:
All types of IBCs

For substances of packing groups II and III:

Wooden: 11C, 11D and 11F

Fibreboard: 11G

Flexible: 13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2

Composite: 11HZ2 and 21HZ2

4.1.3.5 Where the packing instructions in this chapter authorize the use of a particular type of packaging (such as 4G; 1A2), packagings bearing the same packaging identification code followed by the letters "V", "U" or "W" marked in accordance with the provisions of part 6 (such as "4GV", "4GU" or "4GW"; "1A2V", "1A2U" or "1A2W") may also be used under the same conditions and limitations applicable to the use of that type of packaging according to the relevant packing instructions. For example, a combination packaging marked with the packaging code "4GV" may be used whenever a combination packaging marked "4G" is authorized, provided the provisions in the relevant packing instruction regarding types of inner packagings and quantity limitations are respected.

4.1.3.6 Pressure receptacles for liquids and solids

4.1.3.6.1 Unless otherwise indicated in this Code, pressure receptacles conforming to:

(a) the applicable requirements of chapter 6.2; or

(b) the National or International standards on the design, construction, testing, manufacturing and inspection, as applied by the country in which the pressure receptacles are manufactured, provided that the provisions of 4.1.3.6 and 6.2.3.3 are met,

are authorized for the transport of any liquid or solid substance other than explosives, thermally unstable substances, organic peroxides, self-reactive substances, substances where significant pressure may develop by evolution of chemical reaction and radioactive material (unless permitted in 4.1.9).

This sub-section is not applicable to the substances mentioned in 4.1.4.1, packing instruction P200, table 3.

4.1.3.6.2 Every design type of pressure receptacle shall be approved by the competent authority of the country of manufacture or as indicated in chapter 6.2.

4.1.3.6.3 Unless otherwise indicated, pressure receptacles having a minimum test pressure of 0.6 MPa shall be used.

4.1.3.6.4 Unless otherwise indicated, pressure receptacles may be provided with an emergency pressure relief device designed to avoid bursting in case of overfill or fire accidents.

Pressure receptacle valves shall be designed and constructed in such a way that they are inherently able to withstand damage without release of the contents or shall be protected from damage which could cause inadvertent release of the contents of the pressure receptacle, by one of the methods as given in 4.1.6.1.8 (.1) to (.5).

4.1.3.6.5 The level of filling shall not exceed 95% of the capacity of the pressure receptacle at 50°C. Sufficient ullage (outage) shall be left to ensure that the pressure receptacle will not be liquid-full at a temperature of 55°C.

4.1.3.6.6 Unless otherwise indicated, pressure receptacles shall be subjected to a periodic inspection and test every 5 years. The periodic inspection shall include an external examination, an internal examination or alternative method as approved by the competent authority, a pressure test or equivalent effective non-destructive testing with the agreement of the competent authority, including an inspection of all accessories (e.g., tightness of valves, emergency relief valves or fusible elements). Pressure receptacles shall not be filled after they become due for periodic inspection and test but may be transported after the expiry of the time limit. Pressure receptacle repairs shall meet the requirements of 4.1.6.1.11.

4.1.3.6.7 Prior to filling, the filler shall perform an inspection of the pressure receptacle and ensure that the pressure receptacle is authorized for the substances to be transported and that the provisions of this Code have been met. Shut-off valves shall be closed after filling and remain closed during transport. The consignor shall verify that the closures and equipment are not leaking.

4.1.3.6.8 Refillable pressure receptacles shall not be filled with a substance different from that previously contained unless the necessary operations for change of service have been performed.

4.1.3.6.9 Marking of pressure receptacles for liquids and solids according to 4.1.3.6 (not conforming to the requirements of chapter 6.2) shall be in accordance with the requirements of the competent authority of the country of manufacturing.

4.1.3.7 Packagings, including IBCs and large packagings, not specifically authorized in the applicable packing instruction shall not be used for the transport of a substance or article unless specifically approved by the competent authority and provided:

.1 the alternative packaging complies with the general provisions of this chapter;

.2 when the packing instruction indicated in the Dangerous Goods List so specifies, the alternative packaging meets the provisions of part 6;

.3 the competent authority determines that the alternative packaging provides at least the same level of safety as if the substance were packed in accordance with a method specified in the particular packing instruction indicated in the Dangerous Goods List; and

.4 a copy of the competent authority approval accompanies each consignment or the transport document includes an indication that alternative packaging was approved by the competent authority.

Note: The competent authorities granting such approvals shall take action to amend the Code to include the provisions covered by the approval as appropriate.

4.1.3.8 Unpackaged articles other than class 1 articles

4.1.3.8.1 Where large and robust articles cannot be packaged in accordance with the requirements of chapter 6.1 or 6.6 and they have to be transported empty, uncleaned and unpackaged, the competent authority may approve such transport. In doing so, the competent authority shall take into account that:

.1 Large and robust articles shall be strong enough to withstand the shocks and loadings normally encountered during transport, including trans-shipment between cargo transport units and between cargo transport units and warehouses, as well as any removal from a pallet for subsequent manual or mechanical handling;

.2 All closures and openings shall be sealed so that there can be no loss of contents which might be caused under normal conditions of transport, by vibration, or by changes in temperature, humidity or pressure (resulting from altitude, for example). No dangerous residue shall adhere to the outside of the large and robust articles;

.3 Parts of large and robust articles, which are in direct contact with dangerous goods:

.1 shall not be affected or significantly weakened by those dangerous goods; and

.2 shall not cause a dangerous effect, e.g. catalysing a reaction or reacting with the dangerous goods;

.4 Large and robust articles containing liquids shall be stowed and secured to ensure that neither leakage nor permanent distortion of the article occurs during transport;

.5 They shall be fixed in cradles or crates or other handling devices in such a way that they will not become loose during normal conditions of transport.

4.1.3.8.2 Unpackaged articles approved by the competent authority in accordance with the provisions of 4.1.3.8.1 shall be subject to the consignment procedures of part 5. In addition the consignor of such articles shall ensure that a copy of any such approval is transported with the large and robust articles.

Note: A large and robust article may include flexible fuel containment systems, military equipment, machinery or equipment containing dangerous goods above the limited quantity thresholds.

4.1.3.9 Where, in 4.1.3.6 and in the individual packing instructions, cylinders and other pressure receptacles for gases are authorized for the transport of any liquid or solid substance, use is also authorized of cylinders and pressure receptacles of a kind normally used for gases which conform to the requirements of the competent authority of the country in which the cylinder or pressure receptacle is filled. Valves shall be suitably protected. Pressure receptacles with capacities of 1 ℓ or less shall be packed in outer packagings constructed of suitable material of adequate strength and design in relation to the capacity of the packaging and its intended use and secured or cushioned so as to prevent significant movement within the outer packaging during normal conditions of transport.

4.1.4 List of packing instructions

4.1.4.1 Packing instructions concerning the use of packagings (except IBCs and large packagings)

P001		PACKING INSTRUCTION (LIQUIDS)			P001
The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met:					
Combination packagings			**Maximum capacity/net mass (see 4.1.3.3)**		
Inner packagings		**Outer packagings**	**Packing group I**	**Packing group II**	**Packing group III**
Glass	10 ℓ	**Drums**			
Plastics	30 ℓ	steel (1A1, 1A2)	75 kg	400 kg	400 kg
Metal	40 ℓ	aluminium (1B1, 1B2)	75 kg	400 kg	400 kg
		other metal (1N1, 1N2)	75 kg	400 kg	400 kg
		plastics (1H1, 1H2)	75 kg	400 kg	400 kg
		plywood (1D)	75 kg	400 kg	400 kg
		fibre (1G)	75 kg	400 kg	400 kg
		Boxes			
		steel (4A)	75 kg	400 kg	400 kg
		aluminium (4B)	75 kg	400 kg	400 kg
		other metal (4N)	75 kg	400 kg	400 kg
		natural wood (4C1, 4C2)	75 kg	400 kg	400 kg
		plywood (4D)	75 kg	400 kg	400 kg
		reconstituted wood (4F)	75 kg	400 kg	400 kg
		fibreboard (4G)	75 kg	400 kg	400 kg
		expanded plastics (4H1)	40 kg	60 kg	60 kg
		solid plastics (4H2)	75 kg	400 kg	400 kg
		Jerricans			
		steel (3A1, 3A2)	60 kg	120 kg	120 kg
		aluminium (3B1, 3B2)	60 kg	120 kg	120 kg
		plastics (3H1, 3H2)	30 kg	120 kg	120 kg
Single packagings					
Drums					
steel, non-removable head (1A1)			250 ℓ	450 ℓ	450 ℓ
steel, removable head (1A2)			prohibited	250 ℓ	250 ℓ
aluminium, non-removable head (1B1)			250 ℓ	450 ℓ	450 ℓ
aluminium, removable head (1B2)			prohibited	250 ℓ	250 ℓ
other metal, non-removable head (1N1)			250 ℓ	450 ℓ	450 ℓ
other metal, removable head (1N2)			prohibited	250 ℓ	250 ℓ
plastics, non-removable head (1H1)			250 ℓ*	450 ℓ	450 ℓ
plastics, removable head (1H2)			prohibited	250 ℓ	250 ℓ
Jerricans					
steel, non-removable head (3A1)			60 ℓ	60 ℓ	60 ℓ
steel, removable head (3A2)			prohibited	60 ℓ	60 ℓ
aluminium, non-removable head (3B1)			60 ℓ	60 ℓ	60 ℓ
aluminium, removable head (3B2)			prohibited	60 ℓ	60 ℓ
plastics, non-removable head (3H1)			60 ℓ*	60 ℓ	60 ℓ
plastics, removable head (3H2)			prohibited	60 ℓ	60 ℓ
Composite packagings					
Plastics receptacle in steel or aluminium drum (6HA1, 6HB1)			250 ℓ	250 ℓ	250 ℓ
Plastics receptacle in fibre, plastics or plywood drum (6HG1, 6HH1, 6HD1)			120 ℓ*	250 ℓ	250 ℓ
Plastics receptacle in steel or aluminium crate or box or plastics receptacle in wood, plywood, fibreboard or solid plastics box (6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2)			60 ℓ*	60 ℓ	60 ℓ
Glass receptacle in steel, aluminium, fibre, plywood, solid plastics or expanded plastics drum (6PA1, 6PB1, 6PG1, 6PD1, 6PH1 or 6PH2) or in a steel, aluminium, wood or fibreboard box or in a wickerwork hamper (6PA2, 6PB2, 6PC, 6PG2 or 6PD2)			60 ℓ	60 ℓ	60 ℓ
Pressure receptacles, provided that the general provisions of 4.1.3.6 are met					

* Not permitted for class 3, packing group I.

P001	PACKING INSTRUCTION (LIQUIDS) *(continued)*	P001

Special packing provisions:

PP1 For UN Nos. 1133, 1210, 1263 and 1866 and for adhesives, printing inks, printing ink related materials, paints, paint related materials and resin solutions which are assigned to UN 3082, metal or plastics packagings for substances of packing groups II and III in quantities of 5 litres or less per packaging are not required to meet the performance tests in chapter 6.1 when transported:

(a) in palletized loads, a pallet box or a unit load device, such as individual packagings placed or stacked and secured by strapping, shrink- or stretch-wrapping or other suitable means to a pallet. For sea transport, the palletized loads, pallet boxes or unit load devices shall be firmly packed and secured in closed cargo transport units; or

(b) as an inner packaging of a combination packaging with a maximum net mass of 40 kg.

PP2 For UN 3065, wooden barrels with a maximum capacity of 250 litres and which do not meet the provisions of chapter 6.1 may be used.

PP4 For UN 1774, packagings shall meet the packing group II performance level.

PP5 For UN 1204, packagings shall be so constructed that explosion is not possible by reason of increased internal pressure. Gas cylinders and gas receptacles shall not be used for these substances.

PP10 For UN 1791, for packing group II, the packaging shall be vented.

PP31 For UN Nos. 1131, 1553, 1693, 1694, 1699, 1701, 2478, 2604, 2785, 3148, 3183, 3184, 3185, 3186, 3187, 3188, 3398 (PG II and III), 3399 (PG II and III), 3413 and 3414, packagings shall be hermetically sealed.

PP33 For UN 1308, for packing groups I and II, only combination packagings with a maximum gross mass of 75 kg are allowed.

PP81 For UN 1790 with more than 60% but not more than 85% hydrogen fluoride and UN 2031 with more than 55% nitric acid, the permitted use of plastics drums and jerricans as single packagings shall be two years from their date of manufacture.

P002	PACKING INSTRUCTION (SOLIDS)	P002

The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met.

Combination packagings			Maximum net mass (see 4.1.3.3)		
Inner packagings		Outer packagings	Packing group I	Packing group II	Packing group III
Glass	10 kg	**Drums**			
Plastics[1]	30 kg	steel (1A1, 1A2)	125 kg	400 kg	400 kg
Metal	40 kg	aluminium (1B1, 1B2)	125 kg	400 kg	400 kg
Paper [1, 2, 3]	50 kg	other metal (1N1, 1N2)	125 kg	400 kg	400 kg
Fibre[1, 2, 3]	50 kg	plastics (1H1, 1H2)	125 kg	400 kg	400 kg
		plywood (1D)	125 kg	400 kg	400 kg
		fibre (1G)	125 kg	400 kg	400 kg
		Boxes			
		steel (4A)	125 kg	400 kg	400 kg
		aluminium (4B)	125 kg	400 kg	400 kg
		other metal (4N)	125 kg	400 kg	400 kg
		natural wood (4C1)	125 kg	400 kg	400 kg
		natural wood with sift-proof walls (4C2)	250 kg	400 kg	400 kg
[1] These inner packagings shall be sift-proof.		plywood (4D)	125 kg	400 kg	400 kg
		reconstituted wood (4F)	125 kg	400 kg	400 kg
[2] These inner packagings shall not be used when the substances being transported may become liquid during transport.		fibreboard (4G)	75 kg	400 kg	400 kg
		expanded plastics (4H1)	40 kg	60 kg	60 kg
		solid plastics (4H2)	125 kg	400 kg	400 kg
		Jerricans			
[3] Paper and fibre inner packagings shall not be used for substances of packing group I.		steel (3A1, 3A2)	75 kg	120 kg	120 kg
		aluminium (3B1, 3B2)	75 kg	120 kg	120 kg
		plastics (3H1, 3H2)	75 kg	120 kg	120 kg
Single packagings					
Drums					
steel (1A1 or 1A2[4])			400 kg	400 kg	400 kg
aluminium (1B1 or 1B2[4])			400 kg	400 kg	400 kg
metal, other than steel or aluminium (1N1 or 1N2[4])			400 kg	400 kg	400 kg
plastics (1H1 or 1H2[4])			400 kg	400 kg	400 kg
fibre (1G[5])			400 kg	400 kg	400 kg
plywood (1D[5])			400 kg	400 kg	400 kg
[4] These packagings shall not be used for substances of packing group I that may become liquid during transport (see 4.1.3.4).					
[5] These packagings shall not be used when the substances being transported may become liquid during transport (see 4.1.3.4).					

P002	PACKING INSTRUCTION (SOLIDS) *(continued)*		P002
The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met.			
	Maximum net mass (see 4.1.3.3)		
Single packagings *(continued)*	**Packing group I**	**Packing group II**	**Packing group III**
Jerricans			
steel (3A1 or 3A2[4])	120 kg	120 kg	120 kg
aluminium (3B1 or 3B2[4])	120 kg	120 kg	120 kg
plastics (3H1 or 3H2[4])	120 kg	120 kg	120 kg
Boxes			
steel (4A)[5]	Not allowed	400 kg	400 kg
aluminium (4B)[5]	Not allowed	400 kg	400 kg
other metal (4N)[5]	Not allowed	400 kg	400 kg
natural wood (4C1)[5]	Not allowed	400 kg	400 kg
natural wood with sift-proof walls (4C2)[5]	Not allowed	400 kg	400 kg
plywood (4D)[5]	Not allowed	400 kg	400 kg
reconstituted wood (4F)[5]	Not allowed	400 kg	400 kg
fibreboard (4G)[5]	Not allowed	400 kg	400 kg
solid plastics (4H2)[5]	Not allowed	400 kg	400 kg
Bags			
bags (5H3, 5H4, 5L3, 5M2)[5]	Not allowed	50 kg	50 kg
Composite packagings			
Plastics receptacle in steel, aluminium, plywood, fibre or plastics drum (6HA1, 6HB1, 6HG1[5], 6HD1[5], or 6HH1)	400 kg	400 kg	400 kg
Plastics receptacle in steel or aluminium crate or box, wooden box, plywood box, fibreboard box or solid plastics box (6HA2, 6HB2, 6HC, 6HD2[5], 6HG2[5] or 6HH2)	75 kg	75 kg	75 kg
Glass receptacle in steel, aluminium, plywood or fibre drum (6PA1, 6PB1, 6PD1[5] or 6PG1[5]) or in steel, aluminium, wood, or fibreboard box or in wickerwork hamper (6PA2, 6PB2, 6PC, 6PG2[5] or 6PD2[5]) or in solid or expanded plastics packaging (6PH2 or 6PH1[5])	75 kg	75 kg	75 kg
[4] These packagings shall not be used for substances of packing group I that may become liquid during transport (see 4.1.3.4).			
[5] These packagings shall not be used when the substances being transported may become liquid during transport (see 4.1.3.4).			
Pressure receptacles, provided that the general provisions of 4.1.3.6 are met			

Special packing provisions:

PP7 For UN 2000, celluloid may be transported unpacked on pallets, wrapped in plastic film and secured by appropriate means, such as steel bands, as a single commodity in closed cargo transport units. Each pallet shall not exceed 1000 kg.

PP8 For UN 2002, packagings shall be so constructed that explosion is not possible by reason of increased internal pressure. Gas cylinders and gas receptacles shall not be used for these substances.

PP9 For UN 3175, UN 3243 and UN 3244, packagings shall conform to a design type that has passed a leakproofness test at the packing group II performance level. For UN 3175 the leakproofness test is not required when the liquids are fully absorbed in solid material contained in sealed bags.

PP11 For UN 1309, packing group III, and UN 1361 and UN 1362, 5M1 bags are allowed if they are overpacked in plastic bags and are wrapped in shrink or stretch wrap on pallets.

PP12 For UN 1361, UN 2213 and UN 3077, 5H1, 5L1 and 5M1 bags are allowed when transported in closed cargo transport units.

PP13 For articles classified under UN 2870, only combination packagings meeting the packing group I performance level are authorized.

PP14 For UN 2211, UN 2698 and UN 3314, packagings are not required to meet the performance tests in chapter 6.1.

PP15 For UN 1324 and UN 2623, packagings shall meet the packing group III performance level.

PP20 For UN 2217, any sift-proof, tearproof receptacle may be used.

PP30 For UN 2471, paper or fibre inner packagings are not permitted.

PP31 For UN Nos. 1362, 1463, 1565, 1575, 1626, 1680, 1689, 1698, 1868, 1889, 1932, 2471, 2545, 2546, 2881, 3048, 3088, 3170, 3174, 3181, 3182, 3189, 3190, 3205, 3206, 3341, 3342, 3448, 3449 and 3450, packagings shall be hermetically sealed.

PP34 For UN 2969 (as whole beans), 5H1, 5L1 and 5M1 bags are permitted.

PP37 For UN 2590 and UN 2212, 5M1 bags are permitted. All bags of any type shall be transported in closed cargo transport units or be placed in closed rigid overpacks.

PP38 For UN 1309, bags are permitted only in closed cargo transport units or as unit loads.

PP84 For UN 1057, rigid outer packagings meeting the packing group II performance level shall be used. The packagings shall be designed and constructed and arranged to prevent movement, inadvertent ignition of the devices or inadvertent release of flammable gas or liquid.

PP85 For UN Nos.1748, 2208, 2880, 3485, 3486 and 3487, bags are not allowed.

P003	PACKING INSTRUCTION	P003

Dangerous goods shall be placed in suitable outer packagings. The packagings shall meet the provisions of 4.1.1.1, 4.1.1.2, 4.1.1.4, 4.1.1.8 and 4.1.3 and be so designed that they meet the construction provisions of 6.1.4. Outer packagings constructed of suitable material, and of adequate strength and design in relation to the packaging capacity and its intended use, shall be used. Where this packing instruction is used for the transport of articles or inner packagings of combination packagings, the packaging shall be designed and constructed to prevent inadvertent discharge of articles during normal conditions of transport.

Special packing provisions:

PP16 For UN 2800, batteries shall be protected from short circuit within the packagings.

PP17 For UN Nos. 2037, packages shall not exceed 55 kg net mass for fibreboard packagings or 125 kg net mass for other packagings.

PP18 For UN 1845, packagings shall be designed and constructed to permit the release of carbon dioxide gas to prevent a build-up of pressure that could rupture the packagings.

PP19 For UN Nos. 1327, 1364, 1365, 1856 and 3360, transport as bales is authorized.

PP20 For UN Nos. 1363, 1386, 1408 and 2793, any sift-proof, tearproof receptacle may be used.

PP32 UN Nos. 2857 and 3358 may be transported unpackaged, in crates or in appropriate overpacks.

PP90 For UN 3506, sealed inner liners or bags of strong leak-proof and puncture resistant material impervious to mercury which will prevent escape of the substance from the package irrespective of the position of the package shall be used.

P004	PACKING INSTRUCTION	P004

This instruction applies to UN Nos. 3473, 3476, 3477, 3478 and 3479

The following packagings are authorized:

(1) For fuel cell cartridges, provided that the general provisions of 4.1.1.1, 4.1.1.2, 4.1.1.3, 4.1.1.6 and 4.1.3 are met:
Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);
Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);
Jerricans (3A2, 3B2, 3H2).
Packagings shall conform to the packing group II performance level.

(2) For fuel cell cartridges packed with equipment: strong outer packagings which meet the general provisions of 4.1.1.1, 4.1.1.2, 4.1.1.6 and 4.1.3.
When fuel cell cartridges are packed with equipment, they shall be packed in inner packagings or placed in the outer packaging with cushioning material or divider(s) so that the fuel cell cartridges are protected against damage that may be caused by the movement or placement of the contents within the outer packaging.
The equipment shall be secured against movement within the outer packaging.
For the purpose of this packing instruction, "equipment" means apparatus requiring the fuel cell cartridges with which it is packed for its operation.

(3) For fuel cell cartridges contained in equipment: strong outer packagings which meet the general provisions of 4.1.1.1, 4.1.1.2, 4.1.1.6 and 4.1.3.
Large robust equipment (see 4.1.3.8) containing fuel cell cartridges may be transported unpackaged. For fuel cell cartridges contained in equipment, the entire system shall be protected against short circuit and inadvertent operation.

P010	**PACKING INSTRUCTION**	**P010**
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met.		
Combination packagings		**Maximum net mass (see 4.1.3.3)**
Inner packagings	**Outer packagings**	
Glass 1 ℓ	**Drums**	
Steel 40 ℓ	steel (1A1, 1A2)	400 kg
	plastics (1H1, 1H2)	400 kg
	plywood (1D)	400 kg
	fibre (1G)	400 kg
	Boxes	
	steel (4A)	400 kg
	natural wood (4C1, 4C2)	400 kg
	plywood (4D)	400 kg
	reconstituted wood (4F)	400 kg
	fibreboard (4G)	400 kg
	expanded plastics (4H1)	60 kg
	solid plastics (4H2)	400 kg
Single packagings		**Maximum capacity (see 4.1.3.3)**
Drums		
steel, non-removable head (1A1)		450 ℓ
Jerricans		
steel, non-removable head (3A1)		60 ℓ
Composite packagings		
plastics receptacle in steel drums (6HA1)		250 ℓ
Steel pressure receptacles provided that the general provisions of 4.1.3.6 are met.		

P099	PACKING INSTRUCTION	P099
Only packagings which are approved for these goods by the competent authority may be used (see 4.1.3.7). A copy of the competent authority approval shall accompany each consignment or the transport document shall include an indication that the packaging was approved by the competent authority.		

P101	PACKING INSTRUCTION	P101
Only packagings which are approved by the competent authority may be used. The State's distinguishing sign for motor vehicles in international traffic of the country for which the authority acts shall be marked on the transport documents as follows: "Packaging approved by the competent authority of …"		

P110(a)	PACKING INSTRUCTION	P110(a)
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags plastics textile, plastic coated or lined rubber textile, rubberized textile **Receptacles** wood	**Bags** plastics textile, plastic coated or lined rubber textile, rubberized **Receptacles** plastics metal wood	**Drums** steel (1A1, 1A2) metal, other than steel or aluminium (1N1, 1N2) plastics (1H1, 1H2)
Additional provisions: 1 The intermediate packagings shall be filled with water-saturated material such as an anti-freeze solution or wetted cushioning. 2 Outer packagings shall be filled with water-saturated material such as an anti-freeze solution or wetted cushioning. Outer packagings shall be constructed and sealed to prevent evaporation of the wetting solution, except for UN 0224 when transported dry.		

P110(b)	PACKING INSTRUCTION	P110(b)
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Receptacles metal wood rubber, conductive plastics, conductive **Bags** rubber, conductive plastics, conductive	**Dividing partitions** metal wood plastics fibreboard	**Boxes** natural wood, sift-proof wall (4C2) plywood (4D) reconstituted wood (4F)
Special packing provisions: **PP42** For UN Nos. 0074, 0113, 0114, 0129, 0130, 0135 and 0224, the following conditions shall be met: .1 inner packagings shall not contain more than 50 g of explosive substance (quantity corresponding to dry substance); .2 compartments between dividing partitions shall not contain more than one inner packaging, firmly fitted; and .3 the outer packaging may be partitioned into up to 25 compartments.		

P111	PACKING INSTRUCTION	P111
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags paper, waterproofed plastics textile, rubberized **Sheets** plastics textile, rubberized **Receptacles** wood	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
Special packing provisions: **PP43** For UN 0159, inner packagings are not required when metal (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2) or plastics (1H1 or 1H2) drums are used as outer packagings.		

P112(a)	PACKING INSTRUCTION (Solid wetted, 1.1D)	P112(a)
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags paper, multiwall, water-resistant plastics textile textile, rubberized woven plastics **Receptacles** metal plastics wood	**Bags** plastics textile, plastic coated or lined **Receptacles** metal plastics wood	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
Additional provision: Intermediate packagings are not required if leakproof removable head drums are used as the outer packaging.		
Special packing provisions: **PP26** For UN Nos. 0004, 0076, 0078, 0154, 0219 and 0394, packagings shall be lead-free. **PP45** For UN 0072 and UN 0226, intermediate packagings are not required.		

P112(b)	PACKING INSTRUCTION (Solid dry, other than powder 1.1D)	P112(b)
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags paper, kraft paper, multiwall, water-resistant plastics textile textile, rubberized woven plastics	**Bags** (for UN 0150 only) plastics textile, plastic coated or lined	**Bags** woven plastics, sift-proof (5H2) woven plastics, water-resistant (5H3) plastics, film (5H4) textile, sift-proof (5L2) textile, water-resistant (5L3) paper, multiwall, water-resistant (5M2) **Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)	
Special packing provisions: **PP26** For UN Nos. 0004, 0076, 0078, 0154, 0216, 0219 and 0386, packagings shall be lead-free. **PP46** For UN 0209, bags, sift-proof (5H2) are recommended for flake or prilled TNT in the dry state and a maximum net mass of 30 kg. **PP47** For UN 0222, inner packagings are not required when the outer packaging is a bag.		

P112(c)	PACKING INSTRUCTION (Solid dry powder 1.1D)	P112(c)

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.

Inner packagings	Intermediate packagings	Outer packagings
Bags paper, multiwall, water-resistant plastics woven plastics **Receptacles** fibreboard metal plastics wood	**Bags** paper, multiwall, water-resistant with inner lining plastics **Receptacles** metal plastics wood	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)

Additional provisions:

1 Inner packagings are not required if drums are used as the outer packaging.

2 The packaging shall be sift-proof.

Special packing provisions:

PP26 For UN Nos. 0004, 0076, 0078, 0154, 0216, 0219 and 0386, packagings shall be lead-free.

PP46 For UN 0209, bags, sift-proof (5H2) are recommended for flake or prilled TNT in the dry state and a maximum net mass of 30 kg.

PP48 For UN 0504, metal packagings shall not be used.

P113	PACKING INSTRUCTION	P113

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.

Inner packagings	Intermediate packagings	Outer packagings
Bags paper plastics textile, rubberized **Receptacles** fibreboard metal plastics wood	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)

Additional provision:

The packaging shall be sift-proof.

Special packing provisions:

PP49 For UN 0094 and UN 0305, no more than 50 g of substance shall be packed in an inner packaging.

PP50 For UN 0027, inner packagings are not necessary when drums are used as the outer packaging.

PP51 For UN 0028, paper kraft or waxed paper sheets may be used as inner packagings.

P114(a)	PACKING INSTRUCTION (Solid wetted)	P114(a)
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags plastics textile woven plastics **Receptacles** metal plastics wood	**Bags** plastics textile, plastic coated or lined **Receptacles** metal plastics **Dividing partitions** wood	**Boxes** steel (4A) metal, other than steel or aluminium (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) fibre (1G) plastics (1H1, 1H2)
Additional provision: Intermediate packagings are not required if leakproof removable head drums are used as the outer packaging.		
Special packing provisions: **PP26** For UN Nos. 0077, 0132, 0234, 0235 and 0236, packagings shall be lead-free. **PP43** For UN 0342, inner packagings are not required when metal (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2) or plastics (1H1 or 1H2) drums are used as outer packagings.		

P114(b)	PACKING INSTRUCTION (Solid dry)	P114(b)
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags paper, kraft plastics textile, sift-proof woven plastics, sift-proof **Receptacles** fibreboard metal paper plastics woven plastics, sift-proof wood	*Not necessary*	**Boxes** natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
Special packing provisions: **PP26** For UN Nos. 0077, 0132, 0234, 0235 and 0236, packagings shall be lead-free. **PP48** For UN 0508 and UN 0509, metal packagings shall not be used. **PP50** For UN Nos. 0160, 0161 and 0508, inner packagings are not necessary when drums are used as the outer packaging. **PP52** For UN 0160 and UN 0161, when metal drums (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2) are used as the outer packaging, metal packagings shall be so constructed that the risk of explosion, by reason of increase in internal pressure from internal or external causes, is prevented.		

P115	PACKING INSTRUCTION	P115
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Receptacles plastics wood	**Bags** plastics in metal receptacles **Drums** metal **Receptacles** wood	**Boxes** natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)

Special packing provisions:

PP45 For UN 0144, intermediate packagings are not required.

PP53 For UN Nos. 0075, 0143, 0495 and 0497, when boxes are used as the outer packaging, inner packagings shall have taped screw-cap closures and be not more than 5 ℓ capacity each. Inner packagings shall be surrounded with non-combustible absorbent cushioning materials. The amount of absorbent cushioning material shall be sufficient to absorb the liquid contents. Metal receptacles shall be cushioned from each other. Net mass of propellant is limited to 30 kg for each package when outer packagings are boxes.

PP54 For UN Nos. 0075, 0143, 0495 and 0497, when drums are used as the outer packaging and when intermediate packagings are drums, they shall be surrounded with non-combustible cushioning material in a quantity sufficient to absorb the liquid contents. A composite packaging consisting of a plastics receptacle in a metal drum may be used instead of the inner and intermediate packagings. The net volume of propellent in each package shall not exceed 120 ℓ.

PP55 For UN 0144, absorbent cushioning material shall be inserted.

PP56 For UN 0144, metal receptacles may be used as inner packagings.

PP57 For UN Nos. 0075, 0143, 0495 and 0497, bags shall be used as intermediate packagings when boxes are used as outer packagings.

PP58 For UN Nos. 0075, 0143, 0495 and 0497, drums shall be used as intermediate packagings when drums are used as outer packagings.

PP59 For UN 0144, fibreboard boxes (4G) may be used as outer packagings.

PP60 For UN 0144, aluminium drums (1B1 or 1B2) and metal, other than steel or aluminium, drums (1N1 or 1N2) shall not be used.

P116	PACKING INSTRUCTION	P116
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags paper, water- and oil-resistant plastics textile, plastic coated or lined woven plastics, sift-proof **Receptacles** fibreboard, water-resistant metal plastics wood, sift-proof **Sheets** paper, water-resistant paper, waxed plastics	*Not necessary*	**Bags** woven plastics (5H1) paper, multiwall, water-resistant (5M2) plastics, film (5H4) textile, sift-proof (5L2) textile, water-resistant (5L3) **Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) fibre (1G) plastics (1H1, 1H2) plywood (1D) **Jerricans** steel (3A1, 3A2) plastics (3H1, 3H2)
Special packing provisions: **PP61** For UN Nos. 0082, 0241, 0331 and 0332, inner packagings are not required if leakproof removable head drums are used as the outer packaging. **PP62** For UN Nos. 0082, 0241, 0331 and 0332, inner packagings are not required when the explosive is contained in a material impervious to liquid. **PP63** For UN 0081, inner packagings are not required when contained in rigid plastic which is impervious to nitric esters. **PP64** For UN 0331, inner packagings are not required when bags (5H2, 5H3 or 5H4) are used as outer packagings. **PP65** For UN Nos. 0082, 0241, 0331 and 0332, bags (5H2 or 5H3) may be used as outer packagings. **PP66** For UN 0081, bags shall not be used as outer packagings.		

P130	PACKING INSTRUCTION	P130
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Not necessary	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
Special packing provision: **PP67** The following applies to UN Nos. 0006, 0009, 0010, 0015, 0016, 0018, 0019, 0034, 0035, 0038, 0039, 0048, 0056, 0137, 0138, 0168, 0169, 0171, 0181, 0182, 0183, 0186, 0221, 0243, 0244, 0245, 0246, 0254, 0280, 0281, 0286, 0287, 0297, 0299, 0300, 0301, 0303, 0321, 0328, 0329, 0344, 0345, 0346, 0347, 0362, 0363, 0370, 0412, 0424, 0425, 0434, 0435, 0436, 0437, 0438, 0451, 0488, and 0502: large and robust explosives articles, normally intended for military use, without their means of initiation or with their means of initiation containing at least two effective protective features, may be transported unpackaged. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of transport. A negative result in Test Series 4 on an unpackaged article indicates that the article can be considered for transport unpackaged. Such unpackaged articles may be fixed to cradles or contained in crates or other suitable handling devices.		

P131	PACKING INSTRUCTION	P131
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags paper plastics **Receptacles** fibreboard metal plastics wood **Reels**	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
Special packing provision: **PP68** For UN Nos. 0029, 0267 and 0455, bags and reels shall not be used as inner packagings.		

P132(a)	PACKING INSTRUCTION (Articles consisting of closed metal, plastics or fibreboard casings that contain a detonating explosive, or consisting of plastics-bonded detonating explosives)	P132(a)
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Not necessary	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)

P132(b)	PACKING INSTRUCTION (Articles without closed casings)	P132(b)
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Receptacles fibreboard metal plastics wood **Sheets** paper plastics	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)

P133	PACKING INSTRUCTION	P133
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Receptacles fibreboard metal plastics wood **Trays, fitted with dividing partitions** fibreboard plastics wood	**Receptacles** fibreboard metal plastics wood	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)
Additional provision: Receptacles are only required as intermediate packagings when the inner packagings are trays.		
Special packing provision: **PP69** For UN Nos. 0043, 0212, 0225, 0268 and 0306, trays shall not be used as inner packagings.		

P134	PACKING INSTRUCTION	P134
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags water-resistant **Receptacles** fibreboard metal plastics wood **Sheets** fibreboard, corrugated **Tubes** fibreboard	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)

P135	PACKING INSTRUCTION	P135
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags paper plastics **Receptacles** fibreboard metal plastics wood **Sheets** paper plastics	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)

P136	PACKING INSTRUCTION	P136
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags plastics textile **Boxes** fibreboard plastics wood **Dividing partitions in the outer packagings**	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)

P137	PACKING INSTRUCTION	P137
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags plastics **Boxes** fibreboard wood **Tubes** fibreboard metal plastics **Dividing partitions in the outer packagings**	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
Special packing provision: **PP70** For UN Nos. 0059, 0439, 0440 and 0441, when the shaped charges are packed singly, the conical cavity shall face downwards and the package shall be marked “THIS SIDE UP”. When the shaped charges are packed in pairs, the conical cavities shall face inwards to minimize the jetting effect in the event of accidental initiation.		

P138	PACKING INSTRUCTION	P138
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags plastics	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
Additional provision: If the ends of the articles are sealed, inner packagings are not necessary.		

P139	PACKING INSTRUCTION	P139
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags plastics **Receptacles** fibreboard metal plastics wood **Reels** **Sheets** paper plastics	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
Special packing provisions: **PP71** For UN Nos. 0065, 0102, 0104, 0289 and 0290, the ends of the detonating cord shall be sealed; for example, by a plug firmly fixed so that the explosive cannot escape. The ends of flexible detonating cord shall be fastened securely. **PP72** For UN 0065 and UN 0289, inner packagings are not required when they are in coils.		

P140	PACKING INSTRUCTION	P140
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags plastics **Reels** **Sheets** paper, kraft plastics **Receptacles** wood	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
Special packing provisions: **PP73** For UN 0105, no inner packagings are required if the ends are sealed. **PP74** For UN 0101, the packaging shall be sift-proof except when the fuse is covered by a paper tube and both ends of the tube are covered with removable caps. **PP75** For UN 0101, steel, aluminium or other metal boxes or drums shall not be used.		

P141	PACKING INSTRUCTION	P141
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Receptacles fibreboard metal plastics wood **Trays, fitted with dividing partitions** plastics wood **Dividing partitions in the outer packagings**	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)

P142	PACKING INSTRUCTION	P142
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags paper plastics **Receptacles** fibreboard metal plastics wood **Sheets** paper **Trays, fitted with dividing partitions** plastics	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)

P143	PACKING INSTRUCTION	P143
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags paper, kraft plastics textile textile, rubberized **Receptacles** fibreboard metal plastics wood **Trays, fitted with dividing partitions** plastics wood	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plywood (1D) fibre (1G) plastics (1H1, 1H2)
Additional provision: Instead of the above inner and outer packagings, composite packagings (6HH2) (plastics receptacle with outer solid box) may be used.		
Special packing provision: **PP76** For UN Nos. 0271, 0272, 0415 and 0491, when metal packagings are used, metal packagings shall be so constructed that the risk of explosion, by reason of increase in internal pressure from internal or external causes, is prevented.		

P144	PACKING INSTRUCTION	P144
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Receptacles fibreboard metal plastics wood **Dividing partitions in the outer packagings**	*Not necessary*	**Boxes** steel (4A) aluminium (4B) other metal (4N) natural wood, ordinary with metal liner (4C1) plywood (4D) with metal liner reconstituted wood with metal liner (4F) plastics, expanded (4H1) plastics, solid (4H2) **Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plastics (1H1, 1H2)
Special packing provision: **PP 77** For UN 0248 and UN 0249, packagings shall be protected against the ingress of water. When water-activated contrivances are transported unpackaged, they shall be provided with at least two independent protective features which prevent the ingress of water.		

P200	PACKING INSTRUCTION	P200

For pressure receptacles, the general packing provisions of 4.1.6.1 shall be met. In addition, for MEGCs, the general requirements of 4.2.4 shall be met.

Cylinders, tubes, pressure drums, bundles of cylinders constructed as specified in 6.2 and MEGCs constructed as specified in 6.7.5 are authorized for the transport of a specific substance when specified in the following tables. For some substances, the special packing provisions may prohibit a particular type of cylinder, tube, pressure drum or bundle of cylinders.

(1) Pressure receptacles containing toxic substances with an LC_{50} less than or equal to 200 $m\ell/m^3$ (ppm) as specified in the table shall not be equipped with any pressure relief device. Pressure relief devices shall be fitted on pressure receptacles used for the transport of UN 1013 carbon dioxide and UN 1070 nitrous oxide. Other pressure receptacles shall be fitted with a pressure relief device if specified by the competent authority of the country of use. The type of pressure relief device, the set-to-discharge pressure and relief capacity of pressure relief devices, if required, shall be specified by the competent authority of the country of use.

(2) The following three tables cover compressed gases (table 1), liquefied and dissolved gases (table 2) and substances not in class 2 (table 3). They provide:

- (a) the UN Number, Proper Shipping Name and description, and classification of the substance;
- (b) the LC_{50} for toxic substances;
- (c) the types of pressure receptacles authorized for the substance, shown by the letter "X";
- (d) the maximum test period for periodic inspection of the pressure receptacles;

  Note: For pressure receptacles which make use of composite materials, the periodic inspection frequencies shall be as determined by the competent authority which approved the receptacles.
- (e) the minimum test pressure of the pressure receptacles;
- (f) the maximum working pressure of the pressure receptacles for compressed gases (where no value is given, the working pressure shall not exceed two thirds of the test pressure) or the maximum filling ratio(s) dependent on the test pressure(s) for liquefied and dissolved gases;
- (g) special packing provisions that are specific to a substance.

(3) In no case shall pressure receptacles be filled in excess of the limit permitted in the following requirements.

- (a) For compressed gases, the working pressure shall be not more than two thirds of the test pressure of the pressure receptacles. Restrictions to this upper limit on working pressure are imposed by special packing provision "o" in (4) below. In no case shall the internal pressure at 65°C exceed the test pressure.
- (b) For high pressure liquefied gases, the filling ratio shall be such that the settled pressure at 65°C does not exceed the test pressure of the pressure receptacles.

  The use of test pressures and filling ratios other than those in the table is permitted, except where (4), special packing provision "o" applies, provided that:
  - (i) the criterion of (4), special packing provision "r" is met when applicable; or
  - (ii) the above criterion is met in all other cases.

  For high pressure liquefied gases and gas mixtures for which relevant data are not available, the maximum filling ratio (*FR*) shall be determined as follows:

$$FR = 8.5 \times 10^{-4} \times d_g \times P_h$$

  where FR = maximum filling ratio
  d_g = gas density (at 15°C, 1 bar) (in g/ℓ)
  P_h = minimum test pressure (in bar)

  If the density of the gas is unknown, the maximum filling ratio shall be determined as follows:

$$FR = \frac{P_h \times MM \times 10^{-3}}{R \times 338}$$

  where FR = maximum filling ratio
  P_h = minimum test pressure (in bar)
  MM = molecular mass (in g/mol)
  R = 8.31451×10^{-2} bar·ℓ/mol·K (gas constant)

  For gas mixtures, the average molecular mass is to be taken, taking into account the volumetric concentrations of the various components.
- (c) For low pressure liquefied gases, the maximum mass of contents per litre of water capacity (filling factor) shall equal 0.95 times the density of the liquid phase at 50°C; in addition, the liquid phase shall not fill the pressure receptacle at any temperature up to 60°C. The test pressure of the pressure receptacle shall be at least equal to the vapour pressure (absolute) of the liquid at 65°C, minus 100 kPa (1 bar).

  For low pressure liquefied gases and gas mixtures for which relevant data are not available, the maximum filling ratio shall be determined as follows:

$$FR = (0.0032 \times BP - 0.24) \times d_l$$

  where FR = maximum filling ratio
  BP = boiling point (in kelvin)
  d_l = density of the liquid at boiling point (in kg/ℓ)
- (d) For UN 1001, acetylene, dissolved, and UN 3374 acetylene, solvent free, see (4), special packing provision "p".

P200	PACKING INSTRUCTION *(continued)*	P200

(4) Special packing provisions:

Material compatibility

a: Aluminium alloy pressure receptacles shall not be used.

b: Copper valves shall not be used.

c: Metal parts in contact with the contents shall not contain more than 65% copper.

d: When steel pressure receptacles are used, only those bearing the "H" mark in accordance with 6.2.2.7.4 (p) are permitted.

Requirements for toxic substances with an LC_{50} less than or equal to 200 $m\ell/m^3$ (ppm)

k: Valve outlets shall be fitted with pressure-retaining gas-tight plugs or caps having threads that match those of the valve outlets.

Each cylinder within a bundle shall be fitted with an individual valve that shall be closed during transport. After filling, the manifold shall be evacuated, purged and plugged.

Bundles containing UN 1045 fluorine, compressed, may be constructed with isolation valves on groups of cylinders not exceeding 150 litres total water capacity instead of isolation valves on every cylinder.

Cylinders and individual cylinders in a bundle shall have a test pressure greater than or equal to 200 bar and a minimum wall thickness of 3.5 mm for aluminium alloy or 2 mm for steel. Individual cylinders not complying with this requirement shall be transported in a rigid outer packaging that will adequately protect the cylinder and its fittings and meeting the packing group I performance level. Pressure drums shall have a minimum wall thickness as specified by the competent authority.

Pressure receptacles shall not be fitted with a pressure relief device.

Cylinders and individual cylinders in a bundle shall be limited to a maximum water capacity of 85 ℓ.

Each valve shall be capable of withstanding the test pressure of the pressure receptacle and be connected directly to the pressure receptacle by either a taper thread or other means which meets the requirements of ISO 10692-2:2001.

Each valve shall either be of the packless type with non-perforated diaphragm, or be of a type which prevents leakage through or past the packing.

Each pressure receptacle shall be tested for leakage after filling.

Gas specific provisions

l: UN 1040 ethylene oxide may also be packed in hermetically sealed glass or metal inner packagings suitably cushioned in fibreboard, wooden or metal boxes meeting the packing group I performance level. The maximum quantity permitted in any glass inner packaging is 30 g, and the maximum quantity permitted in any metal inner packaging is 200 g. After filling, each inner packaging shall be determined to be leaktight by placing the inner packaging in a hot water bath at a temperature, and for a period of time, sufficient to ensure that an internal pressure equal to the vapour pressure of ethylene oxide at 55°C is achieved. The maximum net mass in any outer packaging shall not exceed 2.5 kg.

m: Pressure receptacles shall be filled to a working pressure not exceeding 5 bar.

n: Cylinders and individual cylinders in a bundle shall contain not more than 5 kg of the gas. When bundles containing UN 1045 fluorine, compressed are divided into groups of cylinders in accordance with special packing provision “k” each group shall contain not more than 5 kg of the gas.

o: In no case shall the working pressure or filling ratio shown in the table be exceeded.

p: For UN 1001 acetylene, dissolved and UN 3374 acetylene, solvent free: cylinders shall be filled with a homogeneous monolithic porous material; the working pressure and the quantity of acetylene shall not exceed the values prescribed in the approval or in ISO 3807-1:2000 or ISO 3807-2:2000, as applicable.

For UN 1001 acetylene, dissolved: cylinders shall contain a quantity of acetone or suitable solvent as specified in the approval (see ISO 3807-1:2000 or ISO 3807-2:2000, as applicable); cylinders fitted with pressure relief devices or manifolded together shall be transported vertically.

The test pressure of 52 bar applies only to cylinders conforming to ISO 3807-2:2000.

q: Valve outlets of pressure receptacles for pyrophoric gases or flammable mixtures of gases containing more than 1% of pyrophoric compounds shall be fitted with gas-tight plugs or caps. When these pressure receptacles are manifolded in a bundle, each of the pressure receptacles shall be fitted with an individual valve that shall be closed during transport, and the outlet of the manifold valve shall be fitted with a pressure-retaining gas-tight plug or cap. Gas-tight plugs or caps shall have threads that match those of the valve outlets.

r: The filling ratio of this gas shall be limited such that, if complete decomposition occurs, the pressure does not exceed two thirds of the test pressure of the pressure receptacle.

ra: This gas may also be packed in capsules under the following conditions:

(i) The mass of gas shall not exceed 150 g per capsule;

(ii) The capsules shall be free from faults liable to impair the strength;

(iii) The leakproofness of the closure shall be ensured by an additional device (cap, crown, seal, binding, etc.) capable of preventing any leakage of the closure during transport;

(iv) The capsules shall be placed in an outer packaging of sufficient strength. A package shall not weigh more than 75 kg.

P200	PACKING INSTRUCTION *(continued)*	P200

s: Aluminium alloy pressure receptacles shall be:
- equipped only with brass or stainless steel valves; and
- cleaned in accordance with ISO 11621:1997 and not contaminated with oil.

t: (i) The wall thickness of pressure receptacles shall be not less than 3 mm.

(ii) Prior to transport, it shall be ensured that the pressure has not risen due to potential hydrogen generation.

Periodic inspection

u: The interval between periodic tests may be extended to 10 years for aluminium alloy pressure receptacles when the alloy of the pressure receptacle has been subjected to stress corrosion testing as specified in ISO 7866:1999.

v: The interval between periodic inspections for steel cylinders may be extended to 15 years if approved by the competent authority of the country of use.

Requirements for N.O.S. descriptions and for mixtures

z: The construction materials of the pressure receptacles and their accessories shall be compatible with the contents and shall not react to form harmful or dangerous compounds therewith.

The test pressure and filling ratio shall be calculated in accordance with the relevant requirements of (3).

Toxic substances with an LC_{50} less than or equal to 200 $m\ell/m^3$ shall not be transported in tubes, pressure drums or MEGCs and shall meet the requirements of special packing provision “k”. However, UN 1975 nitric oxide and dinitrogen tetroxide mixtures may be transported in pressure drums.

For pressure receptacles containing pyrophoric gases or flammable mixtures of gases containing more than 1% pyrophoric compounds, the requirements of special packing provision “q” shall be met.

The necessary steps shall be taken to prevent dangerous reactions (i.e. polymerization or decomposition) during transport. If necessary, stabilization or addition of an inhibitor shall be required.

Mixtures containing UN 1911 diborane shall be filled to a pressure such that, if complete decomposition of the diborane occurs, two thirds of the test pressure of the pressure receptacle shall not be exceeded. Mixtures containing UN 2192 germane, other than mixtures of up to 35% germane in hydrogen or nitrogen or up to 28% germane in helium or argon, shall be filled to a pressure such that, if complete decomposition of the germane occurs, two thirds of the test pressure of the pressure receptacle shall not be exceeded.

P200	PACKING INSTRUCTION *(continued)*												P200
Table 1: COMPRESSED GASES													
UN No.	Proper Shipping Name	Class	Subsidiary risk	LC_{50}, ml/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	MEGCs	Test period, years	Test pressure, bar*	Maximum working pressure, bar*	Special packing provisions
1002	AIR, COMPRESSED	2.2			X	X	X	X	X	10			
1006	ARGON, COMPRESSED	2.2			X	X	X	X	X	10			
1016	CARBON MONOXIDE, COMPRESSED	2.3	2.1	3760	X	X	X	X	X	5			u
1023	COAL GAS, COMPRESSED	2.3	2.1		X	X	X	X	X	5			
1045	FLUORINE, COMPRESSED	2.3	5.1, 8	185	X			X		5	200	30	a, k, n, o
1046	HELIUM, COMPRESSED	2.2			X	X	X	X	X	10			
1049	HYDROGEN, COMPRESSED	2.1			X	X	X	X	X	10			d
1056	KRYPTON, COMPRESSED	2.2			X	X	X	X	X	10			
1065	NEON, COMPRESSED	2.2			X	X	X	X	X	10			
1066	NITROGEN, COMPRESSED	2.2			X	X	X	X	X	10			
1071	OIL GAS, COMPRESSED	2.3	2.1		X	X	X	X	X	5			
1072	OXYGEN, COMPRESSED	2.2	5.1		X	X	X	X		10			s
1612	HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE	2.3			X	X	X	X		5			z
1660	NITRIC OXIDE, COMPRESSED	2.3	5.1, 8	115	X			X		5	225	33	k, o
1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.	2.3	2.1	$\leq$5000	X	X	X	X	X	5			z
1954	COMPRESSED GAS, FLAMMABLE, N.O.S	2.1			X	X	X	X	X	10			z
1955	COMPRESSED GAS, TOXIC, N.O.S.	2.3		$\leq$5000	X	X	X	X	X	5			z
1956	COMPRESSED GAS, N.O.S.	2.2			X	X	X	X	X	10			z
1957	DEUTERIUM, COMPRESSED	2.1			X	X	X	X	X	10			d
1964	HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S.	2.1			X	X	X	X	X	10			z
1971	METHANE, COMPRESSED or NATURAL GAS, COMPRESSED with high methane content	2.1			X	X	X	X	X	10			
2034	HYDROGEN AND METHANE MIXTURE, COMPRESSED	2.1			X	X	X	X	X	10			d
2190	OXYGEN DIFLUORIDE, COMPRESSED	2.3	5.1, 8	2.6	X			X		5	200	30	a, k, n, o
3156	COMPRESSED GAS, OXIDIZING, N.O.S.	2.2	5.1		X	X	X	X	X	10			z
3303	COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S.	2.3	5.1	$\leq$5000	X	X	X	X	X	5			z
3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.	2.3	8	$\leq$5000	X	X	X	X	X	5			z
3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	2.3	2.1, 8	$\leq$5000	X	X	X	X	X	5			z
3306	COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	2.3	5.1, 8	$\leq$5000	X	X	X	X	X	5			z

* Where the entries are blank, the maximum working pressure shall not exceed two thirds of the test pressure.

P200	PACKING INSTRUCTION *(continued)*												P200
Table 2: LIQUEFIED GASES AND DISSOLVED GASES													
UN No.	Proper Shipping Name	Class	Subsidiary risk	LC_{50}, mℓ/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	MEGCs	Test period, years	Test pressure, bar*	Filling ratio	Special packing provisions
1001	ACETYLENE, DISSOLVED	2.1			X			X		10	60 52		c, p
1005	AMMONIA, ANHYDROUS	2.3	8	4000	X	X	X	X	X	5	29	0.54	b
1008	BORON TRIFLUORIDE	2.3	8	387	X	X	X	X	X	5	225 300	0.715 0.86	a
1009	BROMOTRIFLUOROMETHANE (REFRIGERANT GAS R 13B1)	2.2			X	X	X	X	X	10	42 120 250	1.13 1.44 1.60	
1010	BUTADIENES, STABILIZED (1,2-butadiene), or	2.1			X	X	X	X	X	10	10	0.59	
1010	BUTADIENES, STABILIZED (1,3-butadiene), or	2.1			X	X	X	X	X	10	10	0.55	
1010	BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED with more than 40% butadienes	2.1			X	X	X	X	X	10			v, z
1011	BUTANE	2.1			X	X	X	X	X	10	10	0.52	v
1012	BUTYLENE (butylenes mixture) or	2.1			X	X	X	X	X	10	10	0.50	z
1012	BUTYLENE (1-butylene) or	2.1			X	X	X	X	X	10	10	0.53	
1012	BUTYLENE (*cis*-2-butylene) or	2.1			X	X	X	X	X	10	10	0.55	
1012	BUTYLENE (*trans*-2-butylene)	2.1			X	X	X	X	X	10	10	0.54	
1013	CARBON DIOXIDE	2.2			X	X	X	X	X	10	190 250	0.68 0.76	
1017	CHLORINE	2.3	5.1, 8	293	X	X	X	X	X	5	22	1.25	a
1018	CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)	2.2			X	X	X	X	X	10	27	1.03	
1020	CHLOROPENTAFLUOROETHANE (REFRIGERANT GAS R 115)	2.2			X	X	X	X	X	10	25	1.05	
1021	1-CHLORO-1,2,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 124)	2.2			X	X	X	X	X	10	11	1.20	
1022	CHLOROTRIFLUOROMETHANE (REFRIGERANT GAS R 13)	2.2			X	X	X	X	X	10	100 120 190 250	0.83 0.90 1.04 1.11	
1026	CYANOGEN	2.3	2.1	350	X	X	X	X	X	5	100	0.70	u
1027	CYCLOPROPANE	2.1			X	X	X	X	X	10	18	0.55	
1028	DICHLORODIFLUOROMETHANE (REFRIGERANT GAS R 12)	2.2			X	X	X	X	X	10	16	1.15	
1029	DICHLOROFLUOROMETHANE (REFRIGERANT GAS R 21)	2.2			X	X	X	X	X	10	10	1.23	
1030	1,1-DIFLUOROETHANE (REFRIGERANT GAS R 152a)	2.1			X	X	X	X	X	10	16	0.79	
1032	DIMETHYLAMINE, ANHYDROUS	2.1			X	X	X	X	X	10	10	0.59	b
1033	DIMETHYL ETHER	2.1			X	X	X	X	X	10	18	0.58	
1035	ETHANE	2.1			X	X	X	X	X	10	95 120 300	0.25 0.30 0.40	
1036	ETHYLAMINE	2.1			X	X	X	X	X	10	10	0.61	b
1037	ETHYL CHLORIDE	2.1			X	X	X	X	X	10	10	0.80	a, ra
1039	ETHYL METHYL ETHER	2.1			X	X	X	X	X	10	10	0.64	
1040	ETHYLENE OXIDE or ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1 MPa (10 bar) at 50°C	2.3	2.1	2900	X	X	X	X	X	5	15	0.78	l

* Where the entries are blank, the maximum working pressure shall not exceed two thirds of the test pressure.

P200	PACKING INSTRUCTION *(continued)*												P200
Table 2: LIQUEFIED GASES AND DISSOLVED GASES *(continued)*													
UN No.	Proper Shipping Name	Class	Subsidiary risk	LC_{50}, ml/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	MEGCs	Test period, years	Test pressure, bar*	Filling ratio	Special packing provisions
1041	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 9% ethylene oxide but not more than 87%	2.1			X	X	X	X	X	10	190 250	0.66 0.75	
1043	FERTILIZER AMMONIATING SOLUTION with free ammonia	2.2			X		X	X		5			b, z
1048	HYDROGEN BROMIDE, ANHYDROUS	2.3	8	2860	X	X	X	X	X	5	60	1.51	a, d
1050	HYDROGEN CHLORIDE, ANHYDROUS	2.3	8	2810	X	X	X	X	X	5	100 120 150 200	0.30 0.56 0.67 0.74	a, d a, d a, d a, d
1053	HYDROGEN SULPHIDE	2.3	2.1	712	X	X	X	X	X	5	48	0.67	d, u
1055	ISOBUTYLENE	2.1			X	X	X	X	X	10	10	0.52	
1058	LIQUEFIED GASES, non-flammable, charged with nitrogen, carbon dioxide or air	2.2			X	X	X	X	X	10	Test pressure = 1.5 × working pressure		
1060	METHYLACETYLENE AND PROPADIENE MIXTURE, STABILIZED or	2.1			X	X	X	X	X	10			c, z
1060	METHYLACETYLENE AND PROPADIENE MIXTURE, STABILIZED (Propadiene with 1% to 4% methylacetylene)	2.1			X	X	X	X	X	10	22	0.52	c
1061	METHYLAMINE, ANHYDROUS	2.1			X	X	X	X	X	10	13	0.58	b
1062	METHYL BROMIDE with not more than 2% chloropicrin	2.3		850	X	X	X	X	X	5	10	1.51	a
1063	METHYL CHLORIDE (REFRIGERANT GAS R 40)	2.1			X	X	X	X	X	10	17	0.81	a
1064	METHYL MERCAPTAN	2.3	2.1	1350	X	X	X	X	X	5	10	0.78	d, u
1067	DINITROGEN TETROXIDE (NITROGEN DIOXIDE)	2.3	5.1, 8	115	X		X	X		5	10	1.30	k
1069	NITROSYL CHLORIDE	2.3	8	35	X			X		5	13	1.10	k
1070	NITROUS OXIDE	2.2	5.1		X	X	X	X	X	10	180 225 250	0.68 0.74 0.75	
1075	PETROLEUM GASES, LIQUEFIED	2.1			X	X	X	X	X	10			v, z
1076	PHOSGENE	2.3	8	5	X		X	X		5	20	1.23	k, a
1077	PROPYLENE	2.1			X	X	X	X	X	10	27	0.43	
1078	REFRIGERANT GAS, N.O.S.	2.2			X	X	X	X	X	10			z
1079	SULPHUR DIOXIDE	2.3	8	2520	X	X	X	X	X	5	12	1.23	
1080	SULPHUR HEXAFLUORIDE	2.2			X	X	X	X	X	10	70 140 160	1.06 1.34 1.38	
1081	TETRAFLUOROETHYLENE, STABILIZED	2.1			X	X	X	X	X	10	200		m, o
1082	TRIFLUOROCHLOROETHYLENE, STABILIZED	2.3	2.1	2000	X	X	X	X	X	5	19	1.13	u
1083	TRIMETHYLAMINE, ANHYDROUS	2.1			X	X	X	X	X	10	10	0.56	b
1085	VINYL BROMIDE, STABILIZED	2.1			X	X	X	X	X	10	10	1.37	a
1086	VINYL CHLORIDE, STABILIZED	2.1			X	X	X	X	X	10	12	0.81	a
1087	VINYL METHYL ETHER, STABILIZED	2.1			X	X	X	X	X	10	10	0.67	
1581	CHLOROPICRIN AND METHYL BROMIDE MIXTURE with more than 2% chloropicrin	2.3		850	X	X	X	X	X	5	10	1.51	a
1582	CHLOROPICRIN AND METHYL CHLORIDE MIXTURE	2.3			X	X	X	X	X	5	17	0.81	a

* Where the entries are blank, the maximum working pressure shall not exceed two thirds of the test pressure.

P200	PACKING INSTRUCTION *(continued)*													P200
	Table 2: LIQUEFIED GASES AND DISSOLVED GASES *(continued)*													
UN No.	Proper Shipping Name	Class	Subsidiary risk	LC_{50}, mℓ/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	MEGCs	Test period, years	Test pressure, bar*	Filling ratio	Special packing provisions
1589	CYANOGEN CHLORIDE, STABILIZED	2.3	8	80	X			X		5	20	1.03	k
1741	BORON TRICHLORIDE	2.3	8	2541	X	X	X	X	X	5	10	1.19	a
1749	CHLORINE TRIFLUORIDE	2.3	5.1, 8	299	X	X	X	X	X	5	30	1.40	a
1858	HEXAFLUOROPROPYLENE (REFRIGERANT GAS R 1216)	2.2			X	X	X	X	X	10	22	1.11	
1859	SILICON TETRAFLUORIDE	2.3	8	450	X	X	X	X	X	5	200 300	0.74 1.10	a
1860	VINYL FLUORIDE, STABILIZED	2.1			X	X	X	X	X	10	250	0.64	a
1911	DIBORANE	2.3	2.1	80	X			X		5	250	0.07	d, k, o
1912	METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	2.1			X	X	X	X	X	10	17	0.81	a
1952	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with not more than 9% ethylene oxide	2.2			X	X	X	X	X	10	190 250	0.66 0.75	
1958	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 114)	2.2			X	X	X	X	X	10	10	1.30	
1959	1,1-DIFLUOROETHYLENE (REFRIGERANT GAS R 1132a)	2.1			X	X	X	X	X	10	250	0.77	
1962	ETHYLENE	2.1			X	X	X	X	X	10	225 300	0.34 0.38	
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.	2.1			X	X	X	X	X	10			v, z
1967	INSECTICIDE GAS, TOXIC, N.O.S.	2.3			X	X	X	X	X	5			z
1968	INSECTICIDE GAS, N.O.S.	2.2			X	X	X	X	X	10			z
1969	ISOBUTANE	2.1			X	X	X	X	X	10	10	0.49	v
1973	CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE with fixed boiling point, with approximately 49% chlorodifluoromethane (REFRIGERANT GAS R 502)	2.2			X	X	X	X	X	10	31	1.01	
1974	CHLORODIFLUOROBROMOMETHANE (REFRIGERANT GAS R 12B1)	2.2			X	X	X	X		10	10	1.61	
1975	NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURE (NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURE)	2.3	5.1, 8	115	X		X	X		5			k, z
1976	OCTAFLUOROCYCLOBUTANE (REFRIGERANT GAS RC 318)	2.2			X	X	X	X	X	10	11	1.32	
1978	PROPANE	2.1			X	X	X	X	X	10	23	0.43	v
1982	TETRAFLUOROMETHANE (REFRIGERANT GAS R 14)	2.2			X	X	X	X	X	10	200 300	0.71 0.90	
1983	1-CHLORO-2,2,2-TRIFLUOROETHANE (REFRIGERANT GAS R 133a)	2.2			X	X	X	X	X	10	10	1.18	
1984	TRIFLUOROMETHANE (REFRIGERANT GAS R 23)	2.2			X	X	X	X	X	10	190 250	0.88 0.96	
2035	1,1,1-TRIFLUOROETHANE (REFRIGERANT GAS R 143a)	2.1			X	X	X	X	X	10	35	0.73	
2036	XENON	2.2			X	X	X	X	X	10	130	1.28	
2044	2,2-DIMETHYLPROPANE	2.1			X	X	X	X	X	10	10	0.53	

* Where the entries are blank, the maximum working pressure shall not exceed two thirds of the test pressure.

P200	PACKING INSTRUCTION *(continued)*													P200
Table 2: LIQUEFIED GASES AND DISSOLVED GASES *(continued)*														
UN No.	Proper Shipping Name	Class	Subsidiary risk	LC_{50}, ml/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	MEGCs	Test period, years	Test pressure, bar*	Filling ratio	Special packing provisions
2073	AMMONIA SOLUTION, relative density less than 0.880 at 15°C in water, with more than 35% but not more than 40% ammonia with more than 40% but not more than 50% ammonia	2.2			X X	X X	X X	X X	X X	5 5	10 12	0.80 0.77	b b
2188	ARSINE	2.3	2.1	20	X			X		5	42	1.10	d, k
2189	DICHLOROSILANE	2.3	2.1, 8	314	X	X	X	X	X	5	10 200	0.90 1.08	a
2191	SULPHURYL FLUORIDE	2.3		3020	X	X	X	X	X	5	50	1.10	u
2192	GERMANE	2.3	2.1	620	X	X	X	X	X	5	250	0.064	d, q, r
2193	HEXAFLUOROETHANE (REFRIGERANT GAS R 116)	2.2			X	X	X	X	X	10	200	1.13	
2194	SELENIUM HEXAFLUORIDE	2.3	8	50	X			X		5	36	1.46	k
2195	TELLURIUM HEXAFLUORIDE	2.3	8	25	X			X		5	20	1.00	k
2196	TUNGSTEN HEXAFLUORIDE	2.3	8	160	X			X		5	10	3.08	a, k
2197	HYDROGEN IODIDE, ANHYDROUS	2.3	8	2860	X	X	X	X	X	5	23	2.25	a, d
2198	PHOSPHORUS PENTAFLUORIDE	2.3	8	190	X			X		5	200 300	0.90 1.25	k k
2199	PHOSPHINE	2.3	2.1	20	X			X		5	225 250	0.30 0.45	d, k, q d, k, q
2200	PROPADIENE, STABILIZED	2.1			X	X	X	X	X	10	22	0.50	
2202	HYDROGEN SELENIDE, ANHYDROUS	2.3	2.1	2	X			X		5	31	1.60	k
2203	SILANE	2.1			X	X	X	X	X	10	225 250	0.32 0.36	q q
2204	CARBONYL SULPHIDE	2.3	2.1	1700	X	X	X	X	X	5	30	0.87	u
2417	CARBONYL FLUORIDE	2.3	8	360	X	X	X	X	X	5	200 300	0.47 0.70	
2418	SULPHUR TETRAFLUORIDE	2.3	8	40	X			X		5	30	0.91	k, a
2419	BROMOTRIFLUOROETHYLENE	2.1			X	X	X	X	X	10	10	1.19	
2420	HEXAFLUOROACETONE	2.3	8	470	X	X	X	X	X	5	22	1.08	
2421	NITROGEN TRIOXIDE	2.3	5.1, 8	57	X			X		5			k
2422	OCTAFLUOROBUT-2-ENE (REFRIGERANT GAS R 1318)	2.2			X	X	X	X	X	10	12	1.34	
2424	OCTAFLUOROPROPANE (REFRIGERANT GAS R 218)	2.2			X	X	X	X	X	10	25	1.04	
2451	NITROGEN TRIFLUORIDE	2.2	5.1		X	X	X	X	X	10	200	0.50	
2452	ETHYLACETYLENE, STABILIZED	2.1			X	X	X	X	X	10	10	0.57	c
2453	ETHYL FLUORIDE (REFRIGERANT GAS R 161)	2.1			X	X	X	X	X	10	30	0.57	
2454	METHYL FLUORIDE (REFRIGERANT GAS R 41)	2.1			X	X	X	X	X	10	300	0.63	
2455	METHYL NITRITE	2.2	(see special provision 900)										
2517	1-CHLORO-1,1-DIFLUOROETHANE (REFRIGERANT GAS R 142b)	2.1			X	X	X	X	X	10	10	0.99	
2534	METHYLCHLOROSILANE	2.3	2.1, 8	600	X	X	X	X	X	5			z
2548	CHLORINE PENTAFLUORIDE	2.3	5.1, 8	122	X			X		5	13	1.49	a, k

* Where the entries are blank, the maximum working pressure shall not exceed two thirds of the test pressure.

P200	PACKING INSTRUCTION *(continued)*												P200
	Table 2: LIQUEFIED GASES AND DISSOLVED GASES *(continued)*												
UN No.	Proper Shipping Name	Class	Subsidiary risk	LC_{50}, mℓ/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	MEGCs	Test period, years	Test pressure, bar*	Filling ratio	Special packing provisions
2599	CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE with approximately 60% chlorotrifluoromethane (REFRIGERANT GAS R 503)	2.2			X	X	X	X	X	10	31 42 100	0.12 0.17 0.64	
2601	CYCLOBUTANE	2.1			X	X	X	X	X	10	10	0.63	
2602	DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE with approximately 74% dichlorodifluoromethane (REFRIGERANT GAS R 500)	2.2			X	X	X	X	X	10	22	1.01	
2676	STIBINE	2.3	2.1	20	X			X		5	200	0.49	k, r
2901	BROMINE CHLORIDE	2.3	5.1, 8	290	X	X	X	X	X	5	10	1.50	a
3057	TRIFLUOROACETYL CHLORIDE	2.3	8	10	X		X	X		5	17	1.17	k
3070	ETHYLENE OXIDE AND DICHLORODIFLUORO-METHANE MIXTURE with not more than 12.5% ethylene oxide	2.2			X	X	X	X	X	10	18	1.09	
3083	PERCHLORYL FLUORIDE	2.3	5.1	770	X	X	X	X	X	5	33	1.21	u
3153	PERFLUORO(METHYL VINYL ETHER)	2.1			X	X	X	X	X	10	20	0.75	
3154	PERFLUORO(ETHYL VINYL ETHER)	2.1			X	X	X	X	X	10	10	0.98	
3157	LIQUEFIED GAS, OXIDIZING, N.O.S.	2.2	5.1		X	X	X	X	X	10			z
3159	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)	2.2			X	X	X	X	X	10	18	1.05	
3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.	2.3	2.1	$\leq$ 5000	X	X	X	X	X	5			z
3161	LIQUEFIED GAS, FLAMMABLE, N.O.S.	2.1			X	X	X	X	X	10			z
3162	LIQUEFIED GAS, TOXIC, N.O.S.	2.3		$\leq$ 5000	X	X	X	X	X	5			z
3163	LIQUEFIED GAS, N.O.S.	2.2			X	X	X	X	X	10			z
3220	PENTAFLUOROETHANE (REFRIGERANT GAS R 125)	2.2			X	X	X	X	X	10	49 35	0.95 0.87	
3252	DIFLUOROMETHANE (REFRIGERANT GAS R 32)	2.1			X	X	X	X	X	10	48	0.78	
3296	HEPTAFLUOROPROPANE (REFRIGERANT GAS R 227)	2.2			X	X	X	X	X	10	13	1.21	
3297	ETHYLENE OXIDE AND CHLOROTETRA-FLUOROETHANE MIXTURE with not more than 8.8% ethylene oxide	2.2			X	X	X	X	X	10	10	1.16	
3298	ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE with not more than 7.9% ethylene oxide	2.2			X	X	X	X	X	10	26	1.02	
3299	ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE with not more than 5.6% ethylene oxide	2.2			X	X	X	X	X	10	17	1.03	
3300	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 87% ethylene oxide	2.3	2.1	More than 2900	X	X	X	X	X	5	28	0.73	
3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.	2.3	5.1	$\leq$ 5000	X	X	X	X	X	5			z
3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.	2.3	8	$\leq$ 5000	X	X	X	X	X	5			z
3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	2.3	2.1, 8	$\leq$ 5000	X	X	X	X	X	5			z
3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	2.3	5.1, 8	$\leq$ 5000	X	X	X	X	X	5			z
3318	AMMONIA SOLUTION, relative density less than 0.880 at 15°C in water, with more than 50% ammonia	2.3	8		X	X	X	X		5			b
3337	REFRIGERANT GAS R 404A	2.2			X	X	X	X	X	10	36	0.82	

* Where the entries are blank, the maximum working pressure shall not exceed two thirds of the test pressure.

P200	PACKING INSTRUCTION *(continued)*												P200
Table 2: LIQUEFIED GASES AND DISSOLVED GASES *(continued)*													
UN No.	Proper Shipping Name	Class	Subsidiary risk	LC_{50}, mℓ/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	MEGCs	Test period, years	Test pressure, bar*	Filling ratio	Special packing provisions
3338	REFRIGERANT GAS R 407A	2.2			X	X	X	X	X	10	32	0.94	
3339	REFRIGERANT GAS R 407B	2.2			X	X	X	X	X	10	33	0.93	
3340	REFRIGERANT GAS R 407C	2.2			X	X	X	X	X	10	30	0.95	
3354	INSECTICIDE GAS, FLAMMABLE, N.O.S.	2.1			X	X	X	X	X	10			z
3355	INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.	2.3	2.1		X	X	X	X	X	5			z
3374	ACETYLENE, SOLVENT FREE	2.1			X			X		5	60 52		c, p

* Where the entries are blank, the maximum working pressure shall not exceed two thirds of the test pressure.

P200	PACKING INSTRUCTION *(continued)*												P200
Table 3: SUBSTANCES NOT IN CLASS 2													
UN No.	Proper Shipping Name	Class	Subsidiary risk	LC_{50}, mℓ/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	MEGCs	Test period, years	Test pressure, bar*	Filling ratio	Special packing provisions
1051	HYDROGEN CYANIDE, STABILIZED containing less than 3% water	6.1	3	40	X			X		5	100	0.55	k
1052	HYDROGEN FLUORIDE, ANHYDROUS	8	6.1	966	X		X	X		5	10	0.84	t, a
1745	BROMINE PENTAFLUORIDE	5.1	6.1, 8	25	X		X	X		5	10	†	k
1746	BROMINE TRIFLUORIDE	5.1	6.1, 8	50	X		X	X		5	10	†	k
2495	IODINE PENTAFLUORIDE	5.1	6.1, 8	120	X		X	X		5	10	†	k
2983	ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE with not more than 30% ethylene oxide	3	6.1		X		X	X		5	10		z

* Where the entries are blank, the maximum working pressure shall not exceed two thirds of the test pressure.
† A minimum ullage of 8% by volume is required.

P201	PACKING INSTRUCTION	P201
This instruction applies to UN 3167, UN 3168 and UN 3169.		
The following packagings are authorized: (1) Cylinders and gas receptacles conforming to the construction, testing and filling requirements approved by the competent authority. (2) The following combination packagings provided that the general provisions of 4.1.1 and 4.1.3 are met: Outer packagings: Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2). Inner packagings: (a) For non-toxic gases, hermetically sealed inner packagings of glass or metal with a maximum capacity of 5ℓ per package; (b) For toxic gases, hermetically sealed inner packagings of glass or metal with a maximum capacity of 1ℓ per package. Packagings shall conform to the packing group III performance level.		

P202	PACKING INSTRUCTION	P202
[Reserved]		

P203	PACKING INSTRUCTION	P203
This instruction applies to class 2 refrigerated liquefied gases.		

Requirements for closed cryogenic receptacles:

(1) The general requirements of 4.1.6.1 shall be met.

(2) The requirements of chapter 6.2 shall be met.

(3) The closed cryogenic receptacles shall be so insulated that they do not become coated with frost.

(4) Test pressure

Refrigerated liquids shall be filled in closed cryogenic receptacles with the following minimum test pressures:

(a) For closed cryogenic receptacles with vacuum insulation, the test pressure shall not be less than 1.3 times the sum of the maximum internal pressure of the filled receptacle, including during filling and discharge, plus 100 kPa (1 bar);

(b) For other closed cryogenic receptacles, the test pressure shall be not less than 1.3 times the maximum internal pressure of the filled receptacle, taking into account the pressure developed during filling and discharge.

(5) Degree of filling

For non-flammable, non-toxic refrigerated liquefied gases the volume of liquid phase at the filling temperature and at a pressure of 100 kPa (1 bar) shall not exceed 98% of the water capacity of the pressure receptacle.

For flammable refrigerated liquefied gases the degree of filling shall remain below the level at which, if the contents were raised to the temperature at which the vapour pressure equalled the opening pressure of the relief valve, the volume of the liquid phase would reach 98% of the water capacity at that temperature.

(6) Pressure-relief devices

Closed cryogenic receptacles shall be fitted with at least one pressure-relief device.

(7) Compatibility

Materials used to ensure the leakproofness of the joints or for the maintenance of the closures shall be compatible with the contents. In the case of receptacles intended for the transport of oxidizing gases (i.e. with a subsidiary risk of 5.1), these materials shall not react with these gases in a dangerous manner.

(8) Periodic inspection

The periodic inspection and test frequencies of pressure relief valves in accordance with 6.2.1.6.3 shall not exceed five years.

Requirements for open cryogenic receptacles:

Only the following non-oxidizing refrigerated liquefied gases of class 2.2 may be transported in open cryogenic receptacles: UN 1913, 1951, 1963, 1970, 1977, 2591, 3136 and 3158.

Open cryogenic receptacles shall be constructed to meet the following requirements:

(1) The receptacles shall be designed, manufactured, tested and equipped in such a way as to withstand all conditions, including fatigue, to which they will be subjected during their normal use and during normal conditions of transport.

(2) The capacity shall be not more than 450 litres.

(3) The receptacle shall have a double wall construction with the space between the inner and outer wall being evacuated (vacuum insulation). The insulation shall prevent the formation of hoar frost on the exterior of the receptacle.

(4) The materials of construction shall have suitable mechanical properties at the service temperature.

(5) Materials which are in direct contact with the dangerous goods shall not be affected or weakened by the dangerous goods intended to be transported and shall not cause a dangerous effect, e.g., catalysing a reaction or reacting with the dangerous goods.

(6) Receptacles of glass double wall construction shall have an outer packaging with suitable cushioning or absorbent materials which withstand the pressures and impacts liable to occur under normal conditions of transport.

(7) The receptacle shall be designed to remain in an upright position during transport, e.g., have a base whose smaller horizontal dimension is greater than the height of the centre of gravity when filled to capacity or be mounted on gimbals.

(8) The openings of the receptacles shall be fitted with devices allowing gases to escape, preventing any splashing out of liquid, and so configured that they remain in place during transport.

(9) Open cryogenic receptacles shall bear the following marks permanently affixed, e.g., by stamping, engraving or etching:

- The manufacturer's name and address;
- The model number or name;
- The serial or batch number;
- The UN Number and Proper Shipping Name of gases for which the receptacle is intended;
- The capacity of the receptacle in litres.

P205	PACKING INSTRUCTION	P205

This instruction applies to UN 3468.

(1) For metal hydride storage systems, the general packing requirements of 4.1.6.1 shall be met.

(2) Only pressure receptacles not exceeding 150 litres in water capacity and having a maximum developed pressure not exceeding 25 MPa are covered by this packing instruction.

(3) Metal hydride storage systems meeting the applicable requirements for the construction and testing of pressure receptacles containing gas of chapter 6.2 are authorized for the transport of hydrogen only.

(4) When steel pressure receptacles or composite pressure receptacles with steel liners are used, only those bearing the "H" mark, in accordance with 6.2.2.9.2(j), shall be used.

(5) Metal hydride storage systems shall meet the service conditions, design criteria, rated capacity, type tests, batch tests, routine tests, test pressure, rated charging pressure and provisions for pressure relief devices for transportable metal hydride storage systems specified in ISO 16111:2008 and their conformity and approval shall be assessed in accordance with 6.2.2.5.

(6) Metal hydride storage systems shall be filled with hydrogen at a pressure not exceeding the rated charging pressure shown in the permanent markings on the system as specified by ISO 16111:2008.

(7) The periodic test requirements for a metal hydride storage system shall be in accordance with ISO 16111:2008 and carried out in accordance with 6.2.2.6, and the interval between periodic inspections shall not exceed five years.

P206	PACKING INSTRUCTION	P206

This instruction applies to UN Nos. 3500, 3501, 3502, 3503, 3504 and 3505.

Unless otherwise indicated in these provisions, cylinders and pressure drums conforming to the applicable requirements of Chapter 6.2 are authorized.

(1) The general packing requirements of 4.1.6.1 shall be met.

(2) The maximum test period for periodic inspection shall be 5 years.

(3) Cylinders and pressure drums shall be so filled that at 50 °C the non-gaseous phase does not exceed 95% of their water capacity and they are not completely filled at 60 °C. When filled, the internal pressure at 65 °C shall not exceed the test pressure of the cylinders and pressure drums. The vapour pressures and volumetric expansion of all substances in the cylinders and pressure drums shall be taken into account.

(4) The minimum test pressure shall be in accordance with P200 for the propellant but shall not be less than 20 bar.

Additional requirement:

Cylinders and pressure drums shall not be offered for transport when connected with spray application equipment such as a hose and wand assembly.

Special packing provision:

PP89 For UN 3501, 3502, 3503, 3504 and 3505, notwithstanding 4.1.6.1.9.2, non-refillable cylinders used may have a water capacity in ℓ not exceeding 1 000 litres divided by the test pressure expressed in bars provided capacity and pressure restrictions of the construction standard comply with ISO 11118:1999, which limits the maximum capacity to 50 ℓ.

P207	PACKING INSTRUCTION	P207

This instruction applies to UN No. 1950..

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(a) Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G);

Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2).

Packagings shall conform to the packing group II performance level.

(b) Rigid outer packagings with a maximum net mass as follows:

Fibreboard	55 kg
Other than fibreboard	125 kg

The provisions of 4.1.1.3 need not be met.

The packagings shall be designed and constructed to prevent movement of the aerosols and inadvertent discharge during normal conditions of transport.

Special packing provision:

PP87 For UN 1950 waste aerosols transported in accordance with special provision 327, the packagings shall have a means of retaining any free liquid that might escape during transport, e.g., absorbent material. The packaging shall be adequately ventilated to prevent the creation of flammable atmosphere and the build-up of pressure.

P300	PACKING INSTRUCTION	P300
This instruction applies to UN 3064.		
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met: Combination packagings consisting of inner metal cans of not more than 1 ℓ capacity each and outer wooden boxes (4C1, 4C2, 4D or 4F) containing not more than 5 ℓ of solution.		
Additional provisions: 1 Metal cans shall be completely surrounded with absorbent cushioning material. 2 Wooden boxes shall be completely lined with suitable material impervious to water and nitroglycerin.		

P301	PACKING INSTRUCTION	P301
This instruction applies to UN 3165.		
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met: (1) Aluminium pressure receptacle made from tubing and having welded heads Primary containment of the fuel within this receptacle shall consist of a welded aluminium bladder having a maximum internal volume of 46 ℓ. The outer receptacle shall have a minimum design gauge pressure of 1,275 kPa and a minimum burst gauge pressure of 2,755 kPa. Each receptacle shall be leak-checked during manufacture and before shipment and shall be found leakproof. The complete inner unit shall be securely packed in non-combustible cushioning material, such as vermiculite, in a strong outer tightly closed metal packaging which will adequately protect all fittings. Maximum quantity of fuel per unit and package is 42 ℓ. (2) Aluminium pressure receptacle Primary containment of the fuel within this receptacle shall consist of a welded vapourtight fuel compartment with an elastomeric bladder having a maximum internal volume of 46 ℓ. The pressure receptacle shall have a minimum design gauge pressure of 2,680 kPa and a minimum burst pressure of 5,170 kPa. Each receptacle shall be leak-checked during manufacture and before shipment and shall be securely packed in non-combustible cushioning material such as vermiculite, in a strong outer tightly closed metal packaging which will adequately protect all fittings. Maximum quantity of fuel per unit and package is 42 ℓ.		

P302	PACKING INSTRUCTION	P302
This instruction applies to UN 3269.		
The following combination packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met: Outer packagings: Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G). Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2). Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2). Inner packagings: The activator (organic peroxide) shall have a maximum quantity of 125 ml per inner packaging if liquid, and 500 g per inner packaging if solid. The base material and the activator shall be each separately packed in inner packagings. The components may be placed in the same outer packaging provided that they will not interact dangerously in the event of a leakage. Packagings shall conform to the packing group II or III performance level according to the criteria for Class 3 applied to the base material.		

P400	PACKING INSTRUCTION	P400

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met. They shall be made of steel and shall be subjected to an initial test and periodic tests every 10 years at a pressure of not less than 1 MPa (10 bar, gauge pressure). During carriage, the liquid shall be under a layer of inert gas with a gauge pressure of not less than 20 kPa (0.2 bar).

(2) Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F or 4G), drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1D or 1G) or jerricans (3A1, 3A2, 3B1 or 3B2) enclosing hermetically sealed metal cans with inner packagings of glass or metal, with a capacity of not more than 1 ℓ each, having threaded closures with gaskets. Inner packagings shall be cushioned on all sides with dry, absorbent, non-combustible material in a quantity sufficient to absorb the entire contents. Inner packagings shall not be filled to more than 90% of their capacity. Outer packagings shall have a maximum net mass of 125 kg.

(3) Steel, aluminium or metal drums (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2), jerricans (3A1, 3A2, 3B1 or 3B2) or boxes (4A, 4B or 4N) with a maximum net mass of 150 kg each with hermetically sealed inner metal cans of not more than 4 ℓ capacity each, with threaded closures fitted with gaskets. Inner packagings shall be cushioned on all sides with dry, absorbent, non-combustible material in a quantity sufficient to absorb the entire contents. Each layer of inner packagings shall be separated by a dividing partition in addition to cushioning material. Inner packagings shall not be filled to more than 90% of their capacity.

Special packing provision:

PP86 For UN 3392 and UN 3394, air shall be eliminated from the vapour space by nitrogen or other means.

P401	PACKING INSTRUCTION	P401

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met. They shall be made of steel and subjected to an initial test and periodic tests every 10 years at a pressure of not less than 0.6 MPa (6 bar, gauge pressure). During carriage, the liquid shall be under a layer of inert gas with a gauge pressure of not less than 20 kPa (0.2 bar).

(2) Combination packagings

Outer packagings:

Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G);

Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1,4H2);

Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2).

Inner packagings:

Glass, metal or plastics which have threaded closures with a maximum capacity of 1 ℓ.

Each inner packaging shall be surrounded by inert cushioning and absorbent material in a quantity sufficient to absorb the entire contents.

The maximum net mass per outer packaging shall not exceed 30 kg.

Special packing provision:

PP31 For UN Nos. 1183, 1242, 1295, 2965 and 2988, packagings shall be hermetically sealed.

P402	PACKING INSTRUCTION	P402

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met. They shall be made of steel and subjected to an initial test and periodic tests every 10 years at a pressure of not less than 0.6 MPa (6 bar, gauge pressure). During carriage, the liquid shall be under a layer of inert gas with a gauge pressure of not less than 20 kPa (0.2 bar).

(2) Combination packagings

Outer packagings:

Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G);

Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);

Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2).

Inner packagings with a maximum net mass as follows:

Glass	10 kg
Metal or plastics	15 kg

Each inner packaging shall be fitted with threaded closures.

Each inner packaging shall be surrounded by inert cushioning and absorbent material in a quantity sufficient to absorb the entire contents.

The maximum net mass per outer packaging shall not exceed 125 kg.

(3) Steel drums (1A1) with a maximum capacity of 250 ℓ.

(4) Composite packagings consisting of plastics receptacle in a steel or aluminium drum (6HA1 or 6HB1) with a maximum capacity of 250 ℓ.

Special packing provision:

PP31 For UN Nos.1389, 1391, 1392, 1420, 1421, 1422, 3148, 3184 (PG II), 3185 (PG II), 3187 (PG II), 3188 (PG II), 3398 (PG I), 3399 (PG I) and 3482, packagings shall be hermetically sealed.

P403	PACKING INSTRUCTION	P403
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
Combination packagings		**Maximum net mass**
Inner packagings	**Outer packagings**	
Glass 2 kg Plastic 15 kg Metal 20 kg Inner packagings shall be hermetically sealed (e.g., by taping or by threaded closures).	**Drums**	
	steel (1A1, 1A2)	400 kg
	aluminium (1B1, 1B2)	400 kg
	other metal (1N1, 1N2)	400 kg
	plastics (1H1, 1H2)	400 kg
	plywood (1D)	400 kg
	fibre (1G)	400 kg
	Boxes	
	steel (4A)	400 kg
	aluminium (4B)	400 kg
	other metal (4N)	400 kg
	natural wood (4C1)	250 kg
	natural wood with sift-proof walls (4C2)	250 kg
	plywood (4D)	250 kg
	reconstituted wood (4F)	125 kg
	fibreboard (4G)	125 kg
	expanded plastics (4H1)	60 kg
	solid plastics (4H2)	250 kg
	Jerricans	
	steel (3A1, 3A2)	120 kg
	aluminium (3B1, 3B2)	120 kg
	plastics (3H1, 3H2)	120 kg
Single packagings		
Drums		
steel (1A1, 1A2)		250 kg
aluminium (1B1, 1B2)		250 kg
metal other than steel or aluminium (1N1, 1N2)		250 kg
plastics (1H1, 1H2)		250 kg
Jerricans		
steel (3A1, 3A2)		120 kg
aluminium (3B1, 3B2)		120 kg
plastics (3H1, 3H2)		120 kg
Composite packagings		
Plastics receptacle in steel or aluminium drum (6HA1 or 6HB1)		250 kg
Plastics receptacle in fibre, plastics or plywood drum (6HG1, 6HH1 or 6HD1)		75 kg
Plastics receptacle in steel, aluminium, wood, plywood, fibreboard or solid plastics box (6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2)		75 kg
Pressure receptacles, provided that the general provisions of 4.1.3.6 are met		
Special packing provisions: **PP31** For UN Nos. 1360, 1397, 1402 (PG I), 1404, 1407, 1409, 1410, 1413, 1414, 1415, 1418 (PG I), 1419, 1423, 1426, 1427, 1428, 1432, 1433, 1714, 1870, 2010, 2011, 2012, 2013, 2257, 2463, 2806, 2813 (PG I), 3208, 3209, 3401, 3402, 3403 and 3404, packagings shall be hermetically sealed, except for solid fused material. **PP83** For UN 2813, waterproof bags containing not more than 20 g of substance for the purposes of heat formation may be packaged for transport. Each waterproof bag shall be sealed in a plastics bag and placed within an intermediate packaging. No outer packaging shall contain more than 400 g of substance. Water or liquid which may react with the water-reactive substance shall not be included in the packaging.		

P404	PACKING INSTRUCTION	P404
This instruction applies to pyrophoric solids: UN Nos. 1383, 1854, 1855, 2008, 2441, 2545, 2546, 2846, 2881, 3200, 3391 and 3393.		
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met: (1) Combination packagings Outer packagings: (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F or 4H2) Inner packagings: Metal packagings with a maximum net mass of 15 kg each. Inner packagings shall be hermetically sealed and have threaded closures. (2) Metal packagings: (1A1, 1A2, 1B1, 1N1, 1N2, 3A1, 3A2, 3B1 and 3B2) Maximum gross mass: 150 kg (3) Composite packagings: Plastics receptacles in a steel or aluminium drum (6HA1 or 6HB1) Maximum gross mass: 150 kg Pressure receptacles may be used provided that the general provisions of 4.1.3.6 are met.		
Special packing provisions: **PP31** For UN Nos. 1383, 1854, 1855, 2008, 2441, 2545, 2546, 2846, 2881 and 3200, packagings shall be hermetically sealed. **PP86** For UN 3391 and UN 3393, air shall be eliminated from the vapour space by nitrogen or other means.		

P405	PACKING INSTRUCTION	P405
This instruction applies to UN 1381.		
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met: (1) For UN 1381, wet phosphorus: .1 Combination packagings Outer packagings: (4A, 4B, 4N, 4C1, 4C2, 4D or 4F); maximum net mass: 75 kg Inner packagings: (i) hermetically sealed metal cans, with a maximum net mass of 15 kg; or (ii) glass inner packagings cushioned on all sides with dry, absorbent, non-combustible material in a quantity sufficient to absorb the entire contents with a maximum net mass of 2 kg; or .2 Drums (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2); maximum net mass: 400 kg Jerricans (3A1 or 3B1); maximum net mass: 120 kg. These packagings shall be capable of passing the leakproofness test specified in 6.1.5.4 at the packing group II performance level. (2) For UN 1381, dry phosphorus: .1 When fused, drums (1A2, 1B2 or 1N2) with a maximum net mass of 400 kg; or .2 In projectiles or hard-cased articles when transported without class 1 components, as specified by the competent authority.		
Special packing provision: **PP31** For UN 1381, packagings shall be hermetically sealed.		

P406	PACKING INSTRUCTION	P406

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) Combination packagings

Outer packagings: (4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2, 1G, 1D, 1H1, 1H2, 3H1 or 3H2)

Inner packagings shall be water-resistant.

(2) Plastics, plywood or fibreboard drums (1H2, 1D or 1G) or boxes (4A, 4B, 4N, 4C1, 4D, 4F, 4C2, 4G and 4H2) with a water-resistant inner bag, plastics film lining or water-resistant coating.

(3) Metal drums (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2), plastics drums (1H1 or 1H2), metal jerricans (3A1, 3A2, 3B1 or 3B2), plastics jerricans (3H1 or 3H2), plastics receptacle in steel or aluminium drums (6HA1 or 6HB1), plastics receptacle in fibre, plastics or plywood drums (6HG1, 6HH1 or 6HD1), plastics receptacle in steel, aluminium, wood, plywood, fibreboard or solid plastics boxes (6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2).

Additional provisions:

1 Packagings shall be designed and constructed to prevent the loss of water or alcohol content or the content of the phlegmatizer.

2 Packagings shall be so constructed and closed as to avoid an explosive overpressure or pressure build-up of more than 300 kPa (3 bar).

3 The type of packaging and maximum permitted quantity per packaging are limited by the provisions of 2.1.3.4.

Special packing provisions:

PP24 UN Nos. 2852, 3364, 3365, 3366, 3367, 3368 and 3369 shall not be transported in quantities of more than 500 g per package.

PP25 UN 1347 shall not be transported in quantities of more than 15 kg per package.

PP26 For UN Nos. 1310, 1320, 1321, 1322, 1344, 1347, 1348, 1349, 1517, 2907, 3317, 3344 and 3376, packagings shall be lead-free.

PP31 For UN Nos. 1310, 1320, 1321, 1322, 1336, 1337, 1344, 1347, 1348, 1349, 1354, 1355, 1356, 1357, 1517, 1571, 2555, 2556, 2557, 2852, 3317, 3364, 3365, 3366, 3367, 3368, 3369, 3370 and 3376, packagings shall be hermetically sealed.

PP48 For UN 3474, metal packagings shall not be used.

PP78 UN 3370 shall not be transported in quantities of more than 11.5 kg per package.

PP80 For UN 2907 and UN 3344, packagings shall meet the packing group II performance level. Packagings meeting the test criteria of packing group I shall not be used.

P407	PACKING INSTRUCTION	P407

This instruction applies to UN Nos. 1331, 1944, 1945 and 2254.

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

Outer packagings:

Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G);

Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1,4 H2);

Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2).

Inner packagings:

Matches shall be tightly packed in securely closed inner packagings to prevent accidental ignition under normal conditions of transport.

The maximum gross mass of the package shall not exceed 45 kg except for fibreboard boxes which shall not exceed 30 kg.

Packagings shall conform to the packing group III performance level.

Special packing provision:

PP27 UN 1331, Strike-anywhere matches, shall not be packed in the same outer packaging with any other dangerous goods other than safety matches or wax Vesta matches, which shall be packed in separate inner packagings. Inner packagings shall not contain more than 700 strike-anywhere matches.

P408	PACKING INSTRUCTION	P408
This instruction applies to UN 3292.		
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met: (1) For cells: Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A2, 3B2, 3H2). There shall be sufficient cushioning material to prevent contact between cells and between cells and the internal surfaces of the outer packaging and to ensure that no dangerous movement of the cells within the outer packaging occurs in transport. Packagings shall conform to the packing group II performance level. (2) Batteries may be transported unpacked or in protective enclosures (e.g., fully enclosed or wooden slatted crates). The terminals shall not support the weight of other batteries or materials packed with the batteries. Packagings need not meet the requirements of 4.1.1.3.		
Additional requirement: Cells and batteries shall be protected against short circuit and shall be isolated in such a manner as to prevent short circuits.		

P409	PACKING INSTRUCTION	P409
This instruction applies to UN Nos. 2956, 3242 and 3251.		
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met: (1) Fibre drum (1G) which may be fitted with a liner or coating; maximum net mass: 50 kg. (2) Combination packagings: Fibreboard box (4G) with a single inner plastic bag; maximum net mass: 50 kg. (3) Combination packagings: Fibreboard box (4G) or fibre drum (1G) with inner plastic packagings each containing a maximum of 5 kg; maximum net mass: 25 kg.		

P410	PACKING INSTRUCTION	P410
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met.		
Combination packagings	**Maximum net mass**	
Inner packagings	**Packing group II**	**Packing group III**
Glass 10 kg Plastics[1] 30 kg Metal 40 kg Paper[1, 2] 10 kg Fibre[1, 2] 10 kg	**Drums** steel (1A1, 1A2) aluminium (1B1, 1B2) other metal (1N1, 1N2) plastics (1H1, 1H2) plywood (1D) fibre (1G)[1]	 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg	 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg
	Boxes steel (4A) aluminium (4B) other metal (4N) natural wood (4C1) natural wood with sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G)[1] expanded plastics (4H1) solid plastics (4H2)	 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 60 kg 400 kg	 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 60 kg 400 kg
[1] Packagings shall be sift-proof. [2] These inner packagings shall not be used when the substances being transported may become liquid during transport.	**Jerricans** steel (3A1, 3A2) aluminium (3B1, 3B2) plastics (3H1, 3H2)	 120 kg 120 kg 120 kg	 120 kg 120 kg 120 kg
Single packagings		
Drums steel (1A1 or 1A2) aluminium (1B1 or 1B2) metal other than steel or aluminium (1N1 or 1N2) plastics (1H1 or 1H2)	 400 kg 400 kg 400 kg 400 kg	 400 kg 400 kg 400 kg 400 kg
Jerricans steel (3A1 or 3A2) aluminium (3B1 or 3B2) plastics (3H1 or 3H2)	 120 kg 120 kg 120 kg	 120 kg 120 kg 120 kg
Boxes steel (4A)[3] aluminium (4B)[3] other metal (4N)[3] natural wood (4C1)[3] natural wood with sift-proof walls (4C2)[3] plywood (4D)[3] reconstituted wood (4F)[3] fibreboard (4G)[3] solid plastics (4H2)[3]	 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg	 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg 400 kg
Bags Bags (5H3, 5H4, 5L3, 5M2)[3, 4]	 50 kg	 50 kg
Composite packagings		
Plastics receptacle in steel, aluminium, plywood, fibre or plastics drum (6HA1, 6HB1, 6HG1, 6HD1 or 6HH1)	400 kg	400 kg
Plastics receptacle in steel or aluminium crate or box, wooden box, plywood box, fibreboard box or solid plastics box (6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2)	75 kg	75 kg
Glass receptacle in steel, aluminium, plywood or fibre drum (6PA1, 6PB1, 6PD1 or 6PG1) or in steel, aluminium, wooden, wickerwork hamper or fibreboard box (6PA2, 6PB2, 6PC, 6PD2 or 6PG2) or in solid or expanded plastics packaging (6PH1 or 6PH2)	75 kg	75 kg
[3] These packagings shall not be used when the substances being transported may become liquid during transport. [4] These packagings shall only be used for packing group II substances when transported in a closed cargo transport unit.		
Pressure receptacles, provided that the general provisions of 4.1.3.6 are met		

P410	PACKING INSTRUCTION *(continued)*	P410

Special packing provisions:

PP31 For UN Nos. 1326, 1339, 1340, 1341, 1343, 1352, 1358, 1373, 1374, 1378, 1379, 1382, 1384, 1385, 1390, 1393, 1394, 1400, 1401, 1405, 1417, 1431, 1437, 1871, 1923, 1929, 2004, 2008, 2318, 2545, 2546, 2624, 2805, 2813, 2830, 2835, 2844, 2881, 2940, 3078, 3088, 3170 (PG II), 3182, 3189, 3190, 3205, 3206, 3208 and 3209, packagings shall be hermetically sealed.

PP39 For UN 1378, for metal packagings a venting device is required.

PP40 For the following UN Nos., falling in PG II, bags are not allowed: 1326, 1340, 1352, 1358, 1374, 1378, 1382, 1390, 1393, 1394, 1396, 1400, 1401, 1402, 1405, 1409, 1417, 1418, 1436, 1437, 1871, 2624, 2805, 2813, 2830, 2835, 3078, 3131, 3132, 3134, 3170, 3182, 3208 and 3209.

PP83 For UN 2813, waterproof bags containing not more than 20 g of substance for the purposes of heat formation may be packaged for transport. Each waterproof bag shall be sealed in a plastics bag and placed within an intermediate packaging. No outer packaging shall contain more than 400 g of substance. Water or liquid which may react with the water-reactive substance shall not be included in the packaging.

P411	PACKING INSTRUCTION	P411

This instruction applies to UN 3270.

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);

Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);

Jerricans (3A2, 3B2, 3H2).

provided that explosion is not possible by reason of increased internal pressure.

The maximum net mass shall not exceed 30 kg.

P500	PACKING INSTRUCTION	P500

This instruction applies to UN 3356.

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);

Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);

Jerricans (3A2, 3B2, 3H2).

Packagings shall conform to the packing group II performance level.

The generator(s) shall be transported in a package which meets the following requirements when one generator in the package is actuated:

(a) Other generators in the package will not be actuated;

(b) Packaging material will not ignite; and

(c) The outside surface temperature of the completed package shall not exceed 100 °C.

P501	PACKING INSTRUCTION	P501
This instruction applies to UN 2015.		
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
Combination packagings	**Inner packagings maximum capacity**	**Outer packagings maximum net mass**
(1) Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4H2) or drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D) or jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2) with glass, plastics or metal inner packagings	5 ℓ	125 kg
(2) Fibreboard box (4G) or fibre drum (1G), with plastics or metal inner packagings each in a plastics bag	2 ℓ	50 kg
Single packagings		**Maximum capacity**
Drums		
steel (1A1)		250 ℓ
aluminium (1B1)		250 ℓ
metal other than steel or aluminium (1N1)		250 ℓ
plastics (1H1)		250 ℓ
Jerricans		
steel (3A1)		60 ℓ
aluminium (3B1)		60 ℓ
plastics (3H1)		60 ℓ
Composite packagings		
Plastics receptacle in steel or aluminium drum (6HA1, 6HB1)		250 ℓ
Plastics receptacle in fibre, plastics or plywood drum (6HG1, 6HH1, 6HD1)		250 ℓ
Plastics receptacle in steel or aluminium crate or box or plastics receptacle in wood, plywood, fibreboard or solid plastics box (6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2)		60 ℓ
Glass receptacle in steel, aluminium, fibre, plywood, solid plastics or expanded plastics drum (6PA1, 6PB1, 6PG1, 6PD1, 6PH1 or 6PH2) or in a steel, aluminium, wood, fibreboard or plywood box (6PA2, 6PB2, 6PC, 6PG2 or 6PD2)		60 ℓ
Additional provisions: 1 Packagings shall have a minimum ullage of 10%. 2 Packagings shall be vented.		

P502	PACKING INSTRUCTION	P502
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
Combination packagings		**Maximum net mass**
Inner packagings	**Outer packagings**	
Glass 5 ℓ	**Drums**	
Metal 5 ℓ	steel (1A1, 1A2)	125 kg
Plastic 5 ℓ	aluminium (1B1, 1B2)	125 kg
	other metal (1N1, 1N2)	125 kg
	plywood (1D)	125 kg
	fibre (1G)	125 kg
	plastics (1H1, 1H2)	125 kg
	Boxes	
	steel (4A)	125 kg
	aluminium (4B)	125 kg
	other metal (4N)	125 kg
	natural wood (4C1)	125 kg
	natural wood with sift-proof walls (4C2)	125 kg
	plywood (4D)	125 kg
	reconstituted wood (4F)	125 kg
	fibreboard (4G)	125 kg
	expanded plastics (4H1)	60 kg
	solid plastics (4H2)	125 kg
Single packagings		**Maximum capacity**
Drums		
steel (1A1)		250 ℓ
aluminium (1B1)		250 ℓ
plastics (1H1)		250 ℓ
Jerricans		
steel (3A1)		60 ℓ
aluminium (3B1)		60 ℓ
plastics (3H1)		60 ℓ
Composite packagings		
Plastics receptacle in steel or aluminium drum (6HA1, 6HB1)		250 ℓ
Plastics receptacle in fibre, plastics or plywood drum (6HG1, 6HH1, 6HD1)		250 ℓ
Plastics receptacle in steel or aluminium crate or box or plastics receptacle in wood, plywood, fibreboard or solid plastics box (6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2)		60 ℓ
Glass receptacle in steel, aluminium, fibre, plywood, solid plastics or expanded plastics drum (6PA1, 6PB1, 6PG1, 6PD1, 6PH1 or 6PH2) or in a steel, aluminium, wood, fibreboard or plywood box (6PA2, 6PB2, 6PC, 6PG2 or 6PD2)		60 ℓ
Special packing provision:		
PP28 For UN 1873, only glass inner packagings or receptacles are authorized for combination and composite packagings.		

P503	PACKING INSTRUCTION	P503
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
Combination packagings		**Maximum net mass**
Inner packagings	**Outer packagings**	
Glass 5 kg Metal 5 kg Plastic 5 kg	**Drums**	
	steel (1A1, 1A2)	125 kg
	aluminium (1B1, 1B2)	125 kg
	other metal (1N1, 1N2)	125 kg
	fibre (1G)	125 kg
	plywood (1D)	125 kg
	plastics (1H1, 1H2)	125 kg
	Boxes	
	steel (4A)	125 kg
	aluminium (4B)	125 kg
	other metal (4N)	125 kg
	natural wood (4C1)	125 kg
	natural wood with sift-proof walls (4C2)	125 kg
	plywood (4D)	125 kg
	reconstituted wood (4F)	125 kg
	fibreboard (4G)	40 kg
	expanded plastics (4H1)	60 kg
	solid plastics (4H2)	125 kg
Single packagings		**Maximum net mass**
Metal drums (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2) with a maximum net mass. Fibreboard (1G) or plywood drums (1D) fitted with inner liners.		250 kg 200 kg

P504	PACKING INSTRUCTION	P504
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
Combination packagings		**Maximum net mass**
(1) Outer packagings: (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H2) Inner packagings: Glass receptacles with a maximum capacity of 5 ℓ		75 kg
(2) Outer packagings: 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H2 Inner packagings: Plastics receptacles with a maximum capacity of 30 ℓ		75 kg
(3) Outer packagings: 1G, 4F or 4G Inner packagings: Metal receptacles with a maximum capacity of 40 ℓ		125 kg
(4) Outer packagings: (1A1, 1A2, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 4A, 4B, 4N, 4C1, 4C2, 4D, 4H2) Inner packagings: Metal receptacles with a maximum capacity of 40 ℓ		225 kg
Single packagings		**Maximum capacity**
Drums		
steel, non-removable head (1A1)		250 ℓ
aluminium, non-removable head (1B1)		250 ℓ
metal, other than steel or aluminium, non-removable head (1N1)		250 ℓ
plastics, non-removable head (1H1)		250 ℓ
Jerricans		
steel, non-removable head (3A1)		60 ℓ
aluminium, non-removable head (3B1)		60 ℓ
plastics, non-removable head (3H1)		60 ℓ
Composite packagings		
Plastics receptacle in steel or aluminium drum (6HA1, 6HB1)		250 ℓ
Plastics receptacle in fibre, plastics or plywood drum (6HG1, 6HH1, 6HD1)		120 ℓ
Plastics receptacle in steel or aluminium crate or box or plastics receptacle in wood, plywood, fibreboard or solid plastics box (6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2)		60 ℓ
Glass receptacle in steel, aluminium, fibre, plywood, solid plastics or expanded plastics drum (6PA1, 6PB1, 6PG1, 6PD1, 6PH1 or 6PH2) or in steel, aluminium, wood, fibreboard or plywood box (6PA2, 6PB2, 6PC, 6PG2 or 6PD2)		60 ℓ
Special packing provisions:		
PP10 For UN 2014 and UN 3149, the packaging shall be vented.		
PP31 For UN 2626, packagings shall be hermetically sealed.		

P520	PACKING INSTRUCTION	P520

This instruction applies to organic peroxides of class 5.2 and self-reactive substances of class 4.1.

The packagings listed below are authorized provided the general provisions of 4.1.1 and 4.1.3 and special provisions of 4.1.7 are met.

The packing methods are designated OP1 to OP8. The packing methods appropriate for the individual currently assigned organic peroxides and self-reactive substances are listed in 2.4.2.3.2.3 and 2.5.3.2.4. The quantities specified for each packing method are the maximum quantities authorized per package. The following packagings are authorized:

(1) Combination packagings with outer packagings comprising boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1 and 4H2), drums (1A1, 1A2, 1B1, 1B2, 1G, 1H1, 1H2 and 1D), jerricans (3A1, 3A2, 3B1, 3B2, 3H1 and 3H2);

(2) Single packagings consisting of drums (1A1, 1A2, 1B1, 1B2, 1G, 1H1, 1H2 and 1D) and jerricans (3A1, 3A2, 3B1, 3B2, 3H1 and 3H2);

(3) Composite packagings with plastics inner receptacles (6HA1, 6HA2, 6HB1, 6HB2, 6HC, 6HD1, 6HD2, 6HG1, 6HG2, 6HH1 and 6HH2).

Maximum quantity per packaging/package[1] for packing methods OP1 to OP8

Packing method / Maximum quantity	OP1	OP2[1]	OP3	OP4[1]	OP5	OP6	OP7	OP8
Maximum mass (kg) for solids and for combination packagings (liquid and solid)	0.5	0.5/10	5	5/25	25	50	50	400[2]
Maximum contents in litres for liquids[3]	0.5	–	5	–	30	60	60	225[4]

[1] If two values are given, the first applies to the maximum net mass per inner packaging and the second to the maximum net mass of the complete package.

[2] 60 kg for jerricans/200 kg for boxes and, for solids, 400 kg in combination packagings with outer packagings comprising boxes (4C1, 4C2, 4D, 4F, 4G, 4H1 and 4H2) and with inner packagings of plastics or fibre with a maximum net mass of 25 kg.

[3] Viscous liquids shall be treated as solids when they do not meet the criteria provided in the definition for liquids presented in 1.2.1.

[4] 60 ℓ for jerricans.

Additional provisions:

1 Metal packagings, including inner packagings of combination packagings and outer packagings of combination or composite packagings, may only be used for packing methods OP7 and OP8.

2 In combination packagings, glass receptacles may only be used as inner packagings with a maximum content of 0.5 kg for solids or 0.5 ℓ for liquids.

3 In combination packagings, cushioning materials shall not be readily combustible.

4 The packaging of an organic peroxide or self-reactive substance required to bear an EXPLOSIVE subsidiary risk label (Model No. 1, see 5.2.2.2.2) shall also comply with the provisions given in 4.1.5.10 and 4.1.5.11.

Special packing provisions:

PP21 For certain self-reactive substances of types B or C, UN Nos. 3221, 3222, 3223, 3224, 3231, 3232, 3233 and 3234, a smaller packaging than that allowed by packing methods OP5 or OP6 respectively shall be used (see 4.1.7 and 2.4.2.3.2.3).

PP22 UN 3241, 2-bromo-2-nitropropane-1,3-diol, shall be packed in accordance with packing method OP6.

P600	PACKING INSTRUCTION	P600

This instruction applies to UN Nos. 1700, 2016 and 2017.

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

Outer packagings: (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H2) meeting the packing group II performance level. The articles shall be individually packaged and separated from each other using partitions, dividers, inner packagings or cushioning material to prevent inadvertent discharge during normal conditions of transport.

Maximum net mass: 75 kg

P601	PACKING INSTRUCTION	P601

The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met and the packagings are hermetically sealed:

(1) Combination packagings with a maximum gross mass of 15 kg, consisting of:
- one or more glass inner packaging(s) with a maximum net quantity of 1 litre each and filled to not more than 90% of their capacity; the closure(s) of which shall be physically held in place by any means capable of preventing back-off or loosening by impact or vibration during transport, individually placed in
- metal receptacles together with cushioning and absorbent material sufficient to absorb the entire contents of the glass inner packaging(s), further packed in
- 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings.

(2) Combination packagings consisting of metal inner packagings not exceeding 5 ℓ in capacity individually packed with absorbent material sufficient to absorb the contents and inert cushioning material in 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings with a maximum gross mass of 75 kg. Inner packagings shall not be filled to more than 90% of their capacity. The closure of each inner packaging shall be physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transport.

(3) Packagings consisting of:

Outer packagings: Steel or plastics drums, (1A1, 1A2, 1H1 or 1H2), tested in accordance with the test provisions in 6.1.5 at a mass corresponding to the mass of the assembled package either as a packaging intended to contain inner packagings, or as a single packaging intended to contain solids or liquids, and marked accordingly.

Inner packagings: Drums and composite packagings (1A1, 1B1, 1N1, 1H1 or 6HA1), meeting the provisions of chapter 6.1 for single packagings, subject to the following conditions:

.1 the hydraulic pressure test shall be conducted at a pressure of at least 3 bar (gauge pressure);

.2 the design and production leakproofness tests shall be conducted at a test pressure of 0.30 bar;

.3 they shall be isolated from the outer drum by the use of inert shock-mitigating cushioning material which surrounds the inner packaging on all sides;

.4 their capacity shall not exceed 125 ℓ;

.5 closures shall be of a screw-cap type that are:
- (i) physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transport; and
- (ii) provided with a cap seal.

.6 The outer and inner packagings shall be subjected periodically to a leakproofness test according to .2 at intervals of not more than two and a half years; and

.7 The outer and inner packagings shall bear in clearly legible and durable characters:
- (i) the date (month, year) of the initial testing and the latest periodic test;
- (ii) the name or authorized symbol of the party performing the tests and inspections.

(4) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met. They shall be subjected to an initial test and periodic tests every 10 years at a pressure of not less than 1 MPa (10 bar) (gauge pressure). Pressure receptacles may not be equipped with any pressure relief device. Each pressure receptacle containing a toxic by inhalation liquid with an LC_{50} less than or equal to 200 $m\ell/m^3$ (ppm) shall be closed with a plug or valve conforming to the following:
- (a) Each plug or valve shall have a taper-threaded connection directly to the pressure receptacle and be capable of withstanding the test pressure of the pressure receptacle without damage or leakage;
- (b) Each valve shall be of the packless type with non-perforated diaphragm, except that, for corrosive materials, a valve may be of the packed type with an assembly made gas-tight by means of a seal cap with gasket joint attached to the valve body or the pressure receptacle to prevent loss of material through or past the packing;
- (c) Each valve outlet shall be sealed by a threaded cap or threaded solid plug and inert gasket material;
- (d) The materials of construction for the pressure receptacle, valves, plugs, outlet caps, luting and gaskets shall be compatible with each other and with the lading.

Each pressure receptacle with a wall thickness at any point of less than 2.0 mm and each pressure receptacle that does not have fitted valve protection shall be transported in an outer packaging. Pressure receptacles shall not be manifolded or interconnected.

P602	PACKING INSTRUCTION	P602

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met and the packagings are hermetically sealed:

(1) Combination packagings with a maximum gross mass of 15 kg, consisting of:
- one or more glass inner packaging(s) with a maximum net quantity of 1 litre each and filled to not more than 90% of their capacity, the closure(s) of which shall be physically held in place by any means capable of preventing back-off or loosening by impact or vibration during transport, individually placed in
- metal receptacles together with cushioning and absorbent material sufficient to absorb the entire contents of the glass inner packaging(s), further packed in
- 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings.

(2) Combination packagings consisting of metal inner packagings individually packed with absorbent material sufficient to absorb the contents and inert cushioning material in 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings with a maximum gross mass of 75 kg. Inner packagings shall not be filled to more than 90% of their capacity. The closure of each inner packaging shall be physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transport. Inner packagings shall not exceed 5 ℓ in capacity.

(3) Drums and composite packagings (1A1, 1B1, 1N1, 1H1, 6HA1 or 6HH1), subject to the following conditions:
- .1 the hydraulic pressure test shall be conducted at a pressure of at least 3 bar (gauge pressure);
- .2 the design and production leakproofness tests shall be conducted at a test pressure of 0.30 bar; and
- .3 closures shall be of a screw-cap type that are:
  - (i) physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transport; and
  - (ii) provided with a cap seal.

(4) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met. They shall be subjected to an initial test and periodic tests every 10 years at a pressure of not less than 1 MPa (10 bar) (gauge pressure). Pressure receptacles may not be equipped with any pressure relief device. Each pressure receptacle containing a toxic by inhalation liquid with an LC_{50} less than or equal to 200 $m\ell/m^3$ (ppm) shall be closed with a plug or valve conforming to the following:
- (a) Each plug or valve shall have a taper-threaded connection directly to the pressure receptacle and be capable of withstanding the test pressure of the pressure receptacle without damage or leakage;
- (b) Each valve shall be of the packless type with non-perforated diaphragm, except that, for corrosive materials, a valve may be of the packed type with an assembly made gas-tight by means of a seal cap with gasket joint attached to the valve body or the pressure receptacle to prevent loss of material through or past the packing;
- (c) Each valve outlet shall be sealed by a threaded cap or threaded solid plug and inert gasket material;
- (d) The materials of construction for the pressure receptacle, valves, plugs, outlet caps, luting and gaskets shall be compatible with each other and with the lading.

Each pressure receptacle with a wall thickness at any point of less than 2.0 mm and each pressure receptacle that does not have fitted valve protection shall be transported in an outer packaging. Pressure receptacles shall not be manifolded or interconnected.

P620	PACKING INSTRUCTION	P620

This instruction applies to UN 2814 and UN 2900.

The following packagings are authorized, provided the special packing provisions of 4.1.8 are met:

Packagings meeting the provisions of chapter 6.3 and approved accordingly consisting of:

.1 Inner packagings comprising:

(i) leakproof primary receptacle(s);

(ii) a leakproof secondary packaging;

(iii) other than for solid infectious substances, an absorbent material in sufficient quantity to absorb the entire contents placed between the primary receptacle(s) and the secondary packaging; if multiple primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated so as to prevent contact between them;

.2 A rigid outer packaging:

Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G);

Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);

Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2).

The smallest external dimension shall be not less than 100 mm.

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Additional provisions:

1 Inner packagings containing infectious substances shall not be consolidated with inner packagings containing unrelated types of goods. Complete packages may be overpacked in accordance with the provisions of 1.2.1 and 5.1.2: such an overpack may contain dry ice.

2 Other than for exceptional consignments, such as whole organs which require special packaging, the following additional provisions shall apply:

(a) *Substances consigned at ambient temperatures or at a higher temperature.* Primary receptacles shall be of glass, metal or plastics. Positive means of ensuring a leakproof seal shall be provided, e.g., a heat seal, a skirted stopper or a metal crimp seal. If screw caps are used, they shall be secured by positive means, e.g., tape, paraffin sealing tape or a manufactured locking closure;

(b) *Substances consigned refrigerated or frozen.* Ice, dry ice or other refrigerant shall be placed around the secondary packaging(s) or alternatively in an overpack with one or more complete packages marked in accordance with 6.3.3. Interior supports shall be provided to secure secondary packaging(s) or packages in position after the ice or dry ice has dissipated. If ice is used, the outer packaging or overpack shall be leakproof. If dry ice is used, the outer packaging or overpack shall permit the release of carbon dioxide gas. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used;

(c) *Substances consigned in liquid nitrogen.* Plastics primary receptacles capable of withstanding very low temperature shall be used. The secondary packaging shall also be capable of withstanding very low temperatures, and in most cases will need to be fitted over the primary receptacle individually. Provisions for the consignment of liquid nitrogen shall also be fulfilled. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the liquid nitrogen.

(d) Lyophilized substances may also be transported in primary receptacles that are flame-sealed glass ampoules or rubber-stoppered glass vials fitted with metal seals.

3 Whatever the intended temperature of the consignment, the primary receptacle or the secondary packaging shall be capable of withstanding, without leakage, an internal pressure producing a pressure differential of not less than 95 kPa and temperatures in the range –40°C to +55°C.

4 Other dangerous goods shall not be packed in the same packaging as class 6.2 infectious substances unless they are necessary for maintaining the viability, stabilizing or preventing degradation or neutralizing the hazards of the infectious substances. A quantity of 30 mℓ or less of dangerous goods included in classes 3, 8 or 9 may be packed in each primary receptacle containing infectious substances. These small quantities of dangerous goods of classes 3, 8 or 9 are not subject to any additional provisions of this Code when packed in accordance with this packing instruction.

5 Alternative packagings for the transport of animal material may be authorized by the competent authority in accordance with the provisions of 4.1.3.7.

P621	PACKING INSTRUCTION	P621
This instruction applies to UN 3291.		
The following packagings are authorized provided that the general provisions of 4.1.1 except 4.1.1.15 and 4.1.3 are met: (1) Provided that there is sufficient absorbent material to absorb the entire amount of liquid present and the packaging is capable of retaining liquids: Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A2, 3B2, 3H2). Packagings shall conform to the packing group II performance level for solids. (2) For packages containing larger quantities of liquid: Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G); Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2); Composite packagings (6HA1, 6HB1, 6HG1, 6HH1, 6HD1, 6HA2, 6HB2, 6HC, 6HD2, 6HG2, 6HH2, 6PA1, 6PB1, 6PG1, 6PD1, 6PH1, 6PH2, 6PA2, 6PB2, 6PC, 6PG2 or 6PD2). Packagings shall conform to the packing group II performance level for liquids.		
Additional rerquirement: Packagings intended to contain sharp objects such as broken glass and needles shall be resistant to puncture and retain liquids under the performance test conditions in Chapter 6.1.		

P650	PACKING INSTRUCTION	P650

This instruction applies to UN 3373.

(1) The packaging shall be of good quality, strong enough to withstand the shocks and loadings normally encountered during transport, including transhipment between cargo transport units and between cargo transport units and warehouses as well as any removal from a pallet or overpack for subsequent manual or mechanical handling. Packagings shall be constructed and closed to prevent any loss of contents that might be caused under normal conditions of transport by vibration or by changes in temperature, humidity or pressure.

(2) The packaging shall consist of at least three components:
   (a) a primary receptacle;
   (b) a secondary packaging; and
   (c) an outer packaging.
   of which either the secondary or the outer packaging shall be rigid.

(3) Primary receptacles shall be packed in secondary packagings in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the secondary packaging. Secondary packagings shall be secured in outer packagings with suitable cushioning material. Any leakage of the contents shall not compromise the integrity of the cushioning material or of the outer packaging.

(4) For transport, the mark illustrated below shall be displayed on the external surface of the outer packaging on a background of a contrasting colour and shall be clearly visible and legible. The mark shall be in the form of a square set at an angle of 45° (diamond-shaped) with each side having a length of at least 50 mm, the width of the line shall be at least 2 mm and the letters and numbers shall be at least 6 mm high. The proper shipping name "BIOLOGICAL SUBSTANCE, CATEGORY B" in letters at least 6 mm high shall be marked on the outer packaging adjacent to the diamond-shaped mark.

(5) At least one surface of the outer packaging shall have a minimum dimension of 100 mm × 100 mm.

(6) The completed package shall be capable of successfully passing the drop test in 6.3.5.3 as specified in 6.3.5.2 of this Code at a height of 1.2 m. Following the appropriate drop sequence, there shall be no leakage from the primary receptacle(s) which shall remain protected by absorbent material, when required, in the secondary packaging.

(7) For liquid substances
   (a) The primary receptacle(s) shall be leakproof;
   (b) The secondary packaging shall be leakproof;
   (c) If multiple fragile primary receptacles are placed in a single secondary packaging, they shall either be individually wrapped or separated to prevent contact between them;
   (d) Absorbent material shall be placed between the primary receptacle(s) and the secondary packaging. The absorbent material shall be in a quantity sufficient to absorb the entire contents of the primary receptacle(s) so that any release of the liquid substance will not compromise the integrity of the cushioning material or of the outer packaging;
   (e) The primary receptacle or the secondary packaging shall be capable of withstanding, without leakage, an internal pressure of 95 kPa (0.95 bar).

(8) For solid substances
   (a) The primary receptacle(s) shall be siftproof;
   (b) The secondary packaging shall be siftproof;
   (c) If multiple fragile primary receptacles are placed in a single secondary packaging, they shall either be individually wrapped or separated to prevent contact between them.
   (d) If there is any doubt as to whether or not residual liquid may be present in the primary receptacle during transport then a packaging suitable for liquids, including absorbent materials, shall be used.

P650	PACKING INSTRUCTION *(continued)*	P650

(9) Refrigerated or frozen specimens: Ice, dry ice and liquid nitrogen

(a) When dry ice or liquid nitrogen is used as a coolant, the requirements of 5.5.3 shall apply. When used, ice shall be placed outside the secondary packagings or in the outer packaging or an overpack. Interior supports shall be provided to secure the secondary packagings in the original position. If ice is used, the outside packaging or overpack shall be leakproof.

(b) The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.

(10) When packages are placed in an overpack, the package markings required by this packing instruction shall either be clearly visible or be reproduced on the outside of the overpack.

(11) Infectious substances assigned to UN 3373 which are packed and marked in accordance with this packing instruction are not subject to any other provisions of this Code.

(12) Clear instructions on filling and closing such packages shall be provided by packaging manufacturers and subsequent distributors to the consignor or to the person who prepares the package (e.g., patient) to enable the package to be correctly prepared for transport.

(13) Other dangerous goods shall not be packed in the same packaging as class 6.2 infectious substances unless they are necessary for maintaining the viability, stabilizing or preventing degradation or neutralizing the hazards of the infectious substances. A quantity of 30 mℓ or less of dangerous goods included in classes 3, 8 or 9 may be packed in each primary receptacle containing infectious substances. When these small quantities of dangerous goods are packed with infectious substances in accordance with this packing instruction, no other provisions of the Code need be met.

Additional provision:

Alternative packagings for the transport of animal material may be authorized by the competent authority in accordance with the provisions of 4.1.3.7.

P800	PACKING INSTRUCTION	P800

This instruction applies to UN 2803 and UN 2809.

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

(1) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met.

(2) Steel flasks or bottles with threaded closures with a capacity not exceeding 3.0 ℓ; or

(3) Combination packagings which conform to the following provisions:

(a) Inner packagings shall comprise glass, metal or rigid plastics intended to contain liquids with a maximum net mass of 15 kg each.

(b) The inner packagings shall be packed with sufficient cushioning material to prevent breakage.

(c) Either the inner packagings or the outer packagings shall have inner liners or bags of strong leakproof and puncture-resistant material impervious to the contents and completely surrounding the contents to prevent it from escaping from the package irrespective of its position or orientation.

(d) The following outer packagings and maximum net masses are authorized:

Outer packaging	Maximum net mass
Drums	
steel ((1A1, 1A2)	400 kg
metal, other than steel or aluminium (1N1, 1N2)	400 kg
plastics (1H1, 1H2)	400 kg
plywood (1D)	400 kg
fibre (1G)	400 kg
Boxes	
steel (4A)	400 kg
metal, other than steel or aluminium (4N)	400 kg
natural wood (4C1)	250 kg
natural wood with sift-proof walls (4C2)	250 kg
plywood (4D)	250 kg
reconstituted wood (4F)	125 kg
fibreboard (4G)	125 kg
expanded plastics (4H1)	60 kg
solid plastics (4H2)	125 kg

Special packing provision:

PP41 For UN 2803, when it is necessary to transport gallium at low temperatures in order to maintain it in a completely solid state, the above packagings may be overpacked in a strong, water-resistant outer packaging which contains dry ice or other means of refrigeration. If a refrigerant is used, all of the above materials used in the packaging of gallium shall be chemically and physically resistant to the refrigerant and shall have impact resistance at the low temperatures of the refrigerant employed. If dry ice is used, the outer packaging shall permit the release of carbon dioxide gas.

P801	PACKING INSTRUCTION	P801

This instruction applies to new and used batteries assigned to UN Nos. 2794, 2795 or 3028.

The following packagings are authorized, provided the general provisions of 4.1.1, except 4.1.1.3, and 4.1.3 are met, except that packagings need not conform to the provisions of part 6:

(1) Rigid outer packagings;

(2) Wooden slatted crates;

(3) Pallets.

Used storage batteries may also be transported loose in stainless steel or plastics battery boxes capable of containing any free liquid.

Additional provisions:

1 Batteries shall be protected against short circuits.

2 Batteries stacked shall be adequately secured in tiers separated by a layer of non-conductive material.

3 Battery terminals shall not support the mass of other superimposed elements.

4 Batteries shall be packaged or secured to prevent inadvertent movement.

5 For UN 2794 and UN 2795, batteries shall be capable of passing a tilt test at an angle of 45° with no spillage of liquid.

P802	PACKING INSTRUCTION	P802

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

(1) Combination packagings

Outer packagings: 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2; maximum net mass: 75 kg.

Inner packagings: glass or plastics; maximum capacity: 10 ℓ.

(2) Combination packagings

Outer packagings: 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2; maximum net mass: 125 kg.

Inner packagings: metal; maximum capacity: 40 ℓ

(3) Composite packagings: Glass receptacle in steel, aluminium, plywood or solid plastics drum (6PA1, 6PB1, 6PD1 or 6PH2) or in a steel, aluminium, wood or plywood box (6PA2, 6PB2, 6PC or 6PD2); maximum capacity: 60 ℓ.

(4) Steel drums (1A1) with a maximum capacity of 250 ℓ.

(5) Pressure receptacles may be used provided that the general provisions of 4.1.3.6 are met.

Special packing provisions:

PP79 For UN 1790 with more than 60% but not more than 85% hydrofluoric acid, see P001.

PP81 For UN 1790 with not more than 85% hydrogen fluoride and UN 2031 with more than 55% nitric acid, the permitted use of plastics drums and jerricans as single packagings shall be two years from their date of manufacture.

P803	PACKING INSTRUCTION	P803

This instruction applies to UN 2028.

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

(1) Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);

(2) Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H2);

Maximum net mass: 75 kg.

The articles shall be individually packaged and separated from each other, using partitions, dividers, inner packagings or cushioning material to prevent inadvertent discharge during normal conditions of transport.

P804	PACKING INSTRUCTION	P804

This instruction applies to UN 1744.

The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met and the packagings are hermetically sealed:

(1) Combination packagings with a maximum gross mass of 25 kg, consisting of one or more glass inner packaging(s) with a maximum capacity of 1.3 litres each and filled to no more than 90% of their capacity; the closure(s) of which shall be physically held in place by any means capable of preventing back-off or loosening by impact or vibration during transport, individually placed in:

- metal or rigid plastics receptacles together with cushioning and absorbent material sufficient to absorb the entire contents of the glass inner packaging(s), further packed in:
- 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings.

(2) Combination packagings consisting of metal or polyvinylidene fluoride (PVDF) inner packagings, not exceeding 5 litres in capacity individually packed with absorbent material sufficient to absorb the contents and inert cushioning material in 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings with a maximum gross mass of 75 kg. Inner packagings shall not be filled to more than 90% of their capacity. The closure of each inner packaging shall be physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transport.

(3) Packagings consisting of:

Outer packagings:

Steel or plastics drums (1A1, 1A2, 1H1 or 1H2) tested in accordance with the test requirements in 6.1.5 at a mass corresponding to the mass of the assembled package either as a packaging intended to contain inner packagings, or as a single packaging intended to contain solids or liquids, and marked accordingly;

Inner packagings:

Drums and composite packagings (1A1, 1B1, 1N1, 1H1 or 6HA1) meeting the requirements of chapter 6.1 for single packagings, subject to the following conditions:

(a) The hydraulic pressure test shall be conducted at a pressure of at least 300 kPa (3 bar) (gauge pressure);

(b) The design and production leakproofness tests shall be conducted at a test pressure of 30 kPa (0.3 bar);

(c) They shall be isolated from the outer drum by the use of inert shock-mitigating cushioning material which surrounds the inner packaging on all sides;

(d) Their capacity shall not exceed 125 litres;

(e) Closures shall be of a screw type that are:

(i) Physically held in place by any means capable of preventing back–off or loosening of the closure by impact or vibration during transport;

(ii) Provided with a cap seal;

(f) The outer and inner packagings shall be subjected periodically to an internal inspection and leakproofness test according to (b) at intervals of not more than two and a half years; and

(g) The outer and inner packagings shall bear in clearly legible and durable characters:

(i) the date (month, year) of the initial test and the latest periodic test and inspection of the inner packaging; and

(ii) the name or authorized symbol of the expert performing the tests and inspections.

(4) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met.

(a) They shall be subjected to an initial test and periodic tests every 10 years at a pressure of not less than 1 MPa (10 bar) (gauge pressure);

(b) They shall be subjected periodically to an internal inspection and leakproofness test at intervals of not more than two and a half years;

(c) They may not be equipped with any pressure relief device;

(d) Each pressure receptacle shall be closed with a plug or valve(s) fitted with a secondary closure device; and

(e) The materials of construction for the pressure receptacle, valves, plugs, outlet caps, luting and gaskets shall be compatible with each other and with the contents.

P900	PACKING INSTRUCTION	P900
This instruction applies to UN 2216.		
The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met: (1) Packagings according to P002; or (2) Bags (5H1, 5H2, 5H3, 5H4, 5L1, 5L2, 5L3, 5M1 or 5M2) with a maximum net mass of 50 kg. Fish meal may also be transported unpackaged when it is packed in closed cargo transport units and the free air space has been restricted to a minimum.		

P901	PACKING INSTRUCTION	P901
This instruction applies to UN 3316.		
TThe following combination packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met: Drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2). Packagings shall conform to the performance level consistent with the packing group assigned to the kit as a whole (see 3.3.1, special provision 251). Maximum quantity of dangerous goods per outer packaging: 10 kg excluding the mass of any carbon dioxide, solid (dry ice) used as a refrigerant		
Additional requirement: Dangerous goods in kits shall be packed in inner packagings which shall not exceed either 250 ml or 250 g and shall be protected from other materials in the kit..		

P902	PACKING INSTRUCTION	P902
This instruction applies to UN 3268.		
Packaged articles: The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met: Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); Jerricans (3A2, 3B2, 3H2). Packagings shall conform to the packing group III performance level. The packagings shall be designed and constructed so as to prevent movement of the articles and inadvertent operation during normal conditions of transport. Unpackaged articles: The articles may also be transported unpackaged in dedicated handling devices, vehicles or containers when moved from where they are manufactured to an assembly plant.		
Additional requirement: Any pressure receptable shall be in accordance with the requirements of the competent authority for the substance(s) contained therein.		

P903	PACKING INSTRUCTION	P903

This instruction applies to UN Nos. 3090, 3091, 3480 and 3481.

The following packagings are authorized provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) For cells and batteries:

Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);

Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2);

Jerricans (3A2, 3B2, 3H2).

Cells or batteries shall be packed in packagings so that the cells or batteries are protected against damage that may be caused by the movement or placement of the cells or batteries within the packaging.

Packagings shall conform to the packing group II performance level.

(2) In addition for cells or batteries with a gross mass of 12 kg or more employing a strong, impact resistant outer casing, and assemblies of such cells or batteries:

(a) Strong outer packagings, in protective enclosures (e.g., in fully enclosed or wooden slatted crates); or

(b) Pallets or other handling devices.

Cells or batteries shall be secured to prevent inadvertent movement, and the terminals shall not support the weight of other superimposed elements.

Packagings need not meet the requirements of 4.1.1.3.

(3) For cells or batteries packed with equipment:

Packagings conforming to the requirements in paragraph (1) of this packing instruction, then placed with the equipment in an outer packaging; or

Packagings that completely enclose the cells or batteries, then placed with equipment in a packaging conforming to the requirements in paragraph (1) of this packing instruction.

The equipment shall be secured against movement within the outer packaging.

For the purpose of this packing instruction, "equipment" means apparatus requiring the lithium metal or lithium ion cells or batteries with which it is packed for its operation.

(4) For cells or batteries contained in equipment:

Strong outer packagings constructed of suitable material, and of adequate strength and design in relation to the packaging capacity and its intended use. They shall be constructed in such a manner as to prevent accidental operation during transport. Packagings need not meet the requirements of 4.1.1.3.

Large equipment can be offered for transport unpackaged or on pallets when the cells or batteries are afforded equivalent protection by the equipment in which they are contained.

Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be transported when intentionally active in strong outer packagings. When active, these devices shall meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems.

Additional requirement:

Cells or batteries shall be protected against short circuit.

P904	PACKING INSTRUCTION	P904

This instruction applies to UN 3245.

The following packagings are authorized:

(1) Packagings meeting the provisions of 4.1.1.1, 4.1.1.2, 4.1.1.4, 4.1.1.8 and 4.1.3 and so designed that they meet the construction requirements of 6.1.4. Outer packagings constructed of suitable material, and of adequate strength and design in relation to the packaging capacity and its intended use, shall be used. Where this packing instruction is used for the transport of inner packagings of combination packagings the packaging shall be designed and constructed to prevent inadvertent discharge during normal conditions of transport.

(2) Packagings, which need not conform to the packaging test requirements of part 6, but conforming to the following:

  (a) An inner packaging comprising:

    (i) primary receptacle(s) and a secondary packaging, the primary receptacle(s) or the secondary packaging shall be leakproof for liquids or siftproof for solids;

    (ii) for liquids, absorbent material placed between the primary receptacle(s) and the secondary packaging. The absorbent material shall be in a quantity sufficient to absorb the entire contents of the primary receptacle(s) so that any release of the liquid substance will not compromise the integrity of the cushioning material or of the outer packaging;

    (iii) if multiple fragile primary receptacles are placed in a single secondary packaging they shall be individually wrapped or separated to prevent contact between them;

  (b) An outer packaging shall be strong enough for its capacity, mass and intended use, and with a smallest external dimension of at least 100 mm.

For transport, the mark illustrated below shall be displayed on the external surface of the outer packaging on a background of a contrasting colour and shall be clearly visible and legible. The mark shall be in the form of a square set at an angle of 45° (diamond-shaped) with each side having a length of at least 50 mm; the width of the line shall be at least 2 mm and the letters and numbers shall be at least 6 mm high.

Additional requirement:

Ice, dry ice and liquid nitrogen

When dry ice or liquid nitrogen is used as a coolant, the requirements of 5.5.3 shall apply. When used, ice shall be placed outside the secondary packagings or in the outer packaging or an overpack. Interior supports shall be provided to secure the secondary packaging in the original position. If ice is used, the outside packaging or overpack shall be leakproof.

P905	PACKING INSTRUCTION	P905
This instruction applies to UN 2990 and UN 3072.		
Any suitable packaging is authorized, provided the general provisions of 4.1.1 and 4.1.3 are met, except that packagings need not conform to the provisions of part 6. When the life-saving appliances are constructed to incorporate or are contained in rigid outer weatherproof casings (such as for lifeboats), they may be transported unpackaged.		
Additional provisions: 1 All dangerous substances and articles contained as equipment within the appliances shall be secured to prevent inadvertent movement and in addition: (a) signal devices of class 1 shall be packed in plastics or fibreboard inner packagings; (b) gases (class 2.2) shall be contained in cylinders as specified by the competent authority, which may be connected to the appliance; (c) electric storage batteries (class 8) and lithium batteries (class 9) shall be disconnected or electrically isolated and secured to prevent any spillage of liquid; and (d) small quantities of other dangerous substances (for example in classes 3, 4.1 and 5.2) shall be packed in strong inner packagings. 2 Preparation for transport and packaging shall include provisions to prevent any accidental inflation of the appliance.		

P906	PACKING INSTRUCTION	P906
This instruction applies to UN Nos. 2315, 3151, 3152 and 3432.		
The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met: (1) For liquids and solids containing or contaminated with PCBs or polyhalogenated biphenyls or terphenyls: Packagings in accordance with P001 or P002, as appropriate. (2) For transformers and condensers and other devices: Leakproof containment system which is capable of containing, in addition to the devices, at least 1.25 times the volume of the liquid PCBs, polyhalogenated biphenyls or terphenyls present in them. There shall be sufficient absorbent material in the packagings to absorb at least 1.1 times the volume of liquid which is contained in the devices. In general, transformers and condensers shall be transported in leakproof metal packagings which are capable of holding, in addition to the transformers and condensers, at least 1.25 times the volume of the liquid present in them. Notwithstanding the above, liquids and solids not packaged in accordance with P001 and P002 and unpackaged transformers and condensers may be transported in cargo transport units fitted with a leakproof metal tray to a height of at least 800 mm, containing sufficient inert absorbent material to absorb at least 1.1 times the volume of any free liquid.		
Additional provision: Adequate provisions shall be taken to seal the transformers and condensers to prevent leakage during normal conditions of transport.		

P907	PACKING INSTRUCTION	P907
If the machinery or apparatus is constructed and designed so that the receptacles containing the dangerous goods are afforded adequate protection, an outer packaging is not required. Dangerous goods in machinery or apparatus shall otherwise be packed in outer packagings constructed of suitable material, and of adequate strength and design in relation to the packaging capacity and its intended use, and meeting the applicable requirements of 4.1.1.1. Receptacles containing dangerous goods shall conform to the general provisions in 4.1.1, except that 4.1.1.3, 4.1.1.4, 4.1.1.12 and 4.1.1.14 do not apply. For class 2.2 gases, the inner cylinder or receptacle, its contents and filling density shall be to the satisfaction of the competent authority of the country in which the cylinder or receptacle is filled. In addition, the manner in which receptacles are contained within the machinery or apparatus shall be such that, under normal conditions of transport, damage to receptacles containing the dangerous goods is unlikely; and in the event of damage to the receptacles containing solid or liquid dangerous goods, no leakage of the dangerous goods from the machinery or apparatus is possible (a leakproof liner may be used to satisfy this requirement). Receptacles containing dangerous goods shall be so installed, secured or cushioned as to prevent their breakage or leakage and so as to control their movement within the machinery or apparatus during normal conditions of transport. Cushioning material shall not react dangerously with the content of the receptacles. Any leakage of the contents shall not substantially impair the protective properties of the cushioning material.		

4.1.4.2 Packing instructions concerning the use of IBCs

IBC01	PACKING INSTRUCTION	IBC01
The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met: Metal (31A, 31B and 31N).		

IBC02	PACKING INSTRUCTION	IBC02
The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met: (1) Metal (31A, 31B and 31N); (2) Rigid plastics (31H1 and 31H2); (3) Composite (31HZ1).		
Special packing provisions: **B5** For UN Nos. 1791, 2014, 2984 and 3149, IBCs shall be provided with a device to allow venting during transport. The inlet to the venting device shall be sited in the vapour space of the IBC under maximum filling conditions during transport. **B8** The pure form of this substance shall not be transported in IBCs since it is known to have a vapour pressure of more than 110 kPa at 50°C or 130 kPa at 55°C. **B15** For UN 2031 with more than 55% nitric acid, the permitted use of rigid plastics IBCs and of composite IBCs with a rigid plastics inner receptacle shall be two years from their date of manufacture. **B20** For UN Nos. 1716, 1717, 1736, 1737, 1738, 1742, 1743, 1755, 1764, 1768, 1776, 1778, 1782, 1789, 1790, 1796, 1826, 1830, 1832, 2031, 2308, 2353, 2513, 2584, 2796 and 2817 coming under PG II, IBCs shall be fitted with two shut-off devices.		

IBC03	PACKING INSTRUCTION	IBC03
The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met: (1) Metal (31A, 31B and 31N); (2) Rigid plastics (31H1 and 31H2); (3) Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2).		
Special packing provisions: **B8** The pure form of this substance shall not be transported in IBCs since it is known to have a vapour pressure of more than 110 kPa at 50°C or 130 kPa at 55°C. **B11** Notwithstanding the provisions of 4.1.1.10, UN 2672 ammonia solution in concentrations not exceeding 25% may be transported in rigid or composite plastics IBCs (31H1, 31H2 and 31HZ1).		

IBC04	PACKING INSTRUCTION	IBC04
The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met: Metal (11A, 11B, 11N, 21A, 21B and 21N).		
Special packing provision: **B1** For packing group I substances, IBCs shall be carried in closed cargo transport units or in freight containers/vehicles, which shall have rigid sides or fences at least to the height of the IBC.		

IBC05	PACKING INSTRUCTION	IBC05
The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met: (1) Metal (11A, 11B, 11N, 21A, 21B and 21N); (2) Rigid plastics (11H1, 11H2, 21H1 and 21H2); (3) Composite (11HZ1 and 21HZ1).		
Special packing provisions: **B1** For packing group I substances, IBCs shall be carried in closed cargo transport units or in freight containers/vehicles, which shall have rigid sides or fences at least to the height of the IBC. **B2** For solid substances in IBCs other than metal or rigid plastics IBCs, the IBCs shall be carried in closed cargo transport units or in freight containers/vehicles, which shall have rigid sides or fences at least to the height of the IBC.		

IBC06	PACKING INSTRUCTION	IBC06
The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met: (1) Metal (11A, 11B, 11N, 21A, 21B and 21N); (2) Rigid plastics (11H1, 11H2, 21H1 and 21H2); (3) Composite (11HZ1, 11HZ2, 21HZ1 and 21HZ2).		
Additional provision: Where the solid may become liquid during transport see 4.1.3.4.		
Special packing provisions: **B1** For packing group I substances, IBCs shall be carried in closed cargo transport units or in freight containers/vehicles, which shall have rigid sides or fences at least to the height of the IBC. **B2** For solid substances in IBCs other than metal or rigid plastics IBCs, the IBCs shall be carried in closed cargo transport units or in freight containers/vehicles, which shall have rigid sides or fences at least to the height of the IBC. **B12** For UN 2907, IBCs shall meet the packing group II performance level. IBCs meeting the test criteria of packing group I shall not be used.		

IBC07	PACKING INSTRUCTION	IBC07
The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met: (1) Metal (11A, 11B, 11N, 21A, 21B and 21N); (2) Rigid plastics (11H1, 11H2, 21H1 and 21H2); (3) Composite (11HZ1, 11HZ2, 21HZ1 and 21HZ2); (4) Wooden (11C, 11D and 11F).		
Additional provision: 1 Where the solid may become liquid during transport see 4.1.3.4. 2 Liners of wooden IBCs shall be sift-proof.		
Special packing provisions: **B1** For packing group I substances, IBCs shall be carried in closed cargo transport units or in freight containers/vehicles, which shall have rigid sides or fences at least to the height of the IBC. **B2** For solid substances in IBCs other than metal or rigid plastics IBCs, the IBCs shall be carried in closed cargo transport units or in freight containers/vehicles, which shall have rigid sides or fences at least to the height of the IBC. **B4** Flexible, fibreboard or wooden IBCs shall be sift-proof and water-resistant or shall be fitted with a sift-proof and water-resistant liner.		

IBC08	PACKING INSTRUCTION	IBC08
The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met: (1) Metal (11A, 11B, 11N, 21A, 21B and 21N); (2) Rigid plastics (11H1, 11H2, 21H1 and 21H2); (3) Composite (11HZ1, 11HZ2, 21HZ1 and 21HZ2); (4) Fibreboard (11G); (5) Wooden (11C, 11D and 11F); (6) Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2).		
Additional provision: Where the solid may become liquid during transport see 4.1.3.4.		
Special packing provisions: **B2** For substances, UN 1374 and UN 2590 in IBCs other than metal or rigid plastics IBCs, the IBCs shall be carried in closed cargo transport units or in freight containers/vehicles, which shall have rigid sides or fences at least to the height of the IBC. **B3** Flexible IBCs shall be sift-proof and water-resistant or shall be fitted with a sift-proof and water-resistant liner. **B4** Flexible, fibreboard or wooden IBCs shall be sift-proof and water-resistant or shall be fitted with a sift-proof and water-resistant liner. **B6** For UN Nos. 1327, 1363, 1364, 1365, 1386, 1408, 1841, 2211, 2217, 2793 and 3314, IBCs are not required to meet the IBC testing provisions of chapter 6.5.		

IBC99	PACKING INSTRUCTION	IBC99
Only IBCs which are approved for these goods by the competent authority may be used (see 4.1.3.7). A copy of the competent authority approval shall accompany each consignment or the transport document shall include an indication that the packaging was approved by the competent authority.		

IBC100	PACKING INSTRUCTION	IBC100
This instruction applies to UN Nos. 0082, 0241, 0331 and 0332.		
The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 and special provisions of 4.1.5 are met: (1) Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); (2) Flexible (13H2, 13H3, 13H4, 13L2, 13L3, 13L4 and 13M2); (3) Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); (4) Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2).		
Additional provisions: 1 IBCs shall only be used for free-flowing substances. 2 Flexible IBCs shall only be used for solids.		
Special packing provisions: **B9** For UN 0082, this packing instruction may only be used when the substances are mixtures of ammonium nitrate or other inorganic nitrates with other combustible substances which are not explosive ingredients. Such explosives shall not contain nitroglycerin, similar liquid organic nitrates, or chlorates. Metal IBCs are not authorized. **B10** For UN 0241, this packing instruction may only be used for substances which consist of water as an essential ingredient and high proportions of ammonium nitrate or other oxidizing substances, some or all of which are in solution. The other constituents may include hydrocarbons or aluminium powder, but shall not include nitro-derivatives such as trinitrotoluene. Metal IBCs are not authorized.		

IBC520	PACKING INSTRUCTION				IBC520
This instruction applies to organic peroxides and self-reactive substances of type F.					
The IBCs listed below are authorized for the formulations listed, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 and special provisions of 4.1.7.2 are met. For formulations not listed below, only IBCs which are approved by the competent authority may be used (see 4.1.7.2.2).					
UN No.	**Organic peroxide**	**Type of IBC**	**Maximum quantity (litres)**	**Control temperature**	**Emergency temperature**
3109	**ORGANIC PEROXIDE TYPE F, LIQUID**				
	tert-Butyl hydroperoxide, not more than 72% with water	31A	1250		
	tert-Butyl peroxyacetate, not more than 32% in diluent type A	31HA1	1000		
	tert-Butyl peroxybenzoate, not more than 32% in diluent type A	31A	1250		
	tert-Butyl peroxy-3,5,5-trimethylhexanoate, not more than 37% in diluent type A	31A 31HA1	1250 1000		
	Cumyl hydroperoxide, not more than 90% in diluent type A	31HA1	1250		
	Dibenzoyl peroxide, not more than 42% as a stable dispersion	31H1	1000		
	Di-*tert*-butyl peroxide, not more than 52% in diluent type A	31A 31HA1	1250 1000		
	1,1-Di-(*tert*-butylperoxy)cyclohexane, not more than 37% in diluent type A	31A	1250		
	1,1-Di-(*tert*-butylperoxy)cyclohexane, not more than 42% in diluent type A	31H1	1000		
	Dilauroyl peroxide, not more than 42%, stable dispersion, in water	31HA1	1000		
	Isopropylcumyl hydroperoxide, not more than 72% in diluent type A	31HA1	1250		
	p-Menthyl hydroperoxide, not more than 72% in diluent type A	31HA1	1250		
	Peroxyacetic acid, stabilized, not more than 17%	31H1 31H2 31HA1 31A	1500 1500 1500 1500		
3110	**ORGANIC PEROXIDE TYPE F, SOLID**				
	Dicumyl peroxide	31A 31H1 31HA1	2000		
3119	**ORGANIC PEROXIDE TYPE F, LIQUID, TEMPERATURE CONTROLLED**				
	tert-Amyl peroxypivalate, not more than 32% in diluent type A	31A	1250	+10°C	+15°C
	tert-Butyl peroxy-2-ethylhexanoate, not more than 32% in diluent type B	31HA1 31A	1000 1250	+30°C +30°C	+35°C +35°C
	tert-Butyl peroxyneodecanoate, not more than 32% in diluent type A	31A	1250	0°C	+10°C
	tert-Butyl peroxyneodecanoate, not more than 42%, stable dispersion, in water	31A	1250	–5°C	+5°C
	tert-Butyl peroxyneodecanoate, not more than 52%, stable dispersion, in water	31A	1250	–5°C	+5°C
	tert-Butyl peroxypivalate, not more than 27% in diluent type B	31HA1 31A	1000 1250	+10°C +10°C	+15°C +15°C
	Di-(2-neodecanoylperoxyisopropyl)benzene, not more than 42%, stable dispersion, in water	31A	1250	–15°C	–5°C
	3-Hydroxy-1,1-dimethylbutyl peroxyneodecanoate, not more than 52%, stable dispersion, in water	31A	1250	–15°C	–5°C
	Cumyl peroxyneodecanoate, not more than 52%, stable dispersion, in water	31A	1250	–15°C	–5°C
	Di-(4-*tert*-butylcyclohexyl) peroxydicarbonate, not more than 42%, stable dispersion, in water	31HA1	1000	+30°C	+35°C
	Dicetyl peroxydicarbonate, not more than 42%, stable dispersion, in water	31HA1	1000	+30°C	+35°C
	Dicyclohexyl peroxydicarbonate, not more than 42% as a stable dispersion, in water	31A	1250	+10°C	+15°C
	Di-(2-ethylhexyl) peroxydicarbonate, not more than 62%, stable dispersion, in water	31A	1250	–20°C	–10°C

IBC520	PACKING INSTRUCTION *(continued)*				IBC520
UN No.	**Organic peroxide**	**Type of IBC**	**Maximum quantity (litres)**	**Control temperature**	**Emergency temperature**
3119 *(cont.)*	**ORGANIC PEROXIDE TYPE F, LIQUID, TEMPERATURE CONTROLLED *(continued)***				
	Dimyristyl peroxydicarbonate, not more than 42%, stable dispersion, in water	31HA1	1000	+15°C	+20°C
	Di-(3,5,5-trimethylhexanoyl) peroxide, not more than 52% in diluent type A	31HA1 31A	1000 1250	+10°C +10°C	+15°C +15°C
	Di-(3,5,5-trimethylhexanoyl) peroxide, not more than 52%, stable dispersion, in water	31A	1250	+10°C	+15°C
	Diisobutyryl peroxide, not more than 28% as a stable dispersion in water	*31HA1* *31A*	*1 000* *1 250*	*-20ºC* *-20 ºC*	*-10ºC* *-10 ºC*
	Diisobutyryl peroxide, not more than 42% as a stable dispersion in water	*31HA1* *31A*	*1 000* *1 250*	*-25ºC* *-25 ºC*	*-15ºC* *-15 ºC*
	1,1,3,3-Tetramethylbutyl peroxyneodecanoate, not more than 52%, stable dispersion, in water	31A 31HA1	1250 1000	–5°C –5°C	+5°C +5°C
3120	**ORGANIC PEROXIDE, TYPE F, SOLID, TEMPERATURE CONTROLLED**				

Additional provisions:

1 IBCs shall be provided with a device to allow venting during transport. The inlet to the pressure relief device shall be sited in the vapour space of the IBC under maximum filling conditions during transport.

2 To prevent explosive rupture of metal IBCs or composite IBCs with complete metal casing, the emergency relief devices shall be designed to vent all the decomposition products and vapours evolved during self-accelerating decomposition or during a period of not less than one hour of fire-engulfment as calculated by the formula in 4.2.1.13.8. The control and emergency temperatures specified in this packing instruction are based on a non-insulated IBC. When consigning an organic peroxide in an IBC in accordance with this instruction, it is the responsibility of the consignor to ensure that:

(a) the pressure and emergency relief devices installed on the IBC are designed to take appropriate account of the self-accelerating decomposition of the organic peroxide and of fire engulfment; and

(b) when applicable, the control and emergency temperatures indicated are appropriate, taking into account the design (such as insulation) of the IBC to be used.

IBC620	PACKING INSTRUCTION	IBC620
This instruction applies to UN 3291.		
The following IBCs are authorized, provided that the general provisions of 4.1.1, except 4.1.1.15, 4.1.2 and 4.1.3 are met: Rigid, leakproof IBCs conforming to the packing group II performance level.		
Additional provisions: 1 There shall be sufficient absorbent material to absorb the entire amount of liquid present in the IBC. 2 IBCs shall be capable of retaining liquids. 3 IBCs intended to contain sharp objects such as broken glass and needles shall be resistant to puncture.		

4.1.4.3 Packing instructions concerning the use of large packagings

LP01	PACKING INSTRUCTION (LIQUIDS)			LP01
The following large packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met.				
Inner packagings	**Large outer packagings**	**Packing group I**	**Packing group II**	**Packing group III**
Glass 10 ℓ Plastics 30 ℓ Metal 40 ℓ	Steel (50A) Aluminium (50B) Metal other than steel or aluminium (50N) Rigid plastics (50H) Natural wood (50C) Plywood (50D) Reconstituted wood (50F) Rigid fibreboard (50G)	Not allowed	Not allowed	3 m^3

LP02	PACKING INSTRUCTION (SOLIDS)			LP02
The following large packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met.				
Inner packagings	**Large outer packagings**	**Packing group I**	**Packing group II**	**Packing group III**
Glass 10 kg Plastics[2] 50 kg Metal 50 kg Paper[1, 2] 50 kg Fibre[1, 2] 50 kg	Steel (50A) Aluminium (50B) Metal other than steel or aluminium (50N) Rigid plastics (50H) Natural wood (50C) Plywood (50D) Reconstituted wood (50F) Rigid fibreboard (50G) Flexible plastics (51H)[3]	Not allowed	Not allowed	3 m^3
[1] These packagings shall not be used when the substances being transported may become liquid during transport. [2] Packagings shall be sift-proof. [3] To be used with flexible inner packagings only.				
Special packing provision: **L2** For UN 1950 aerosols, the large packaging shall meet the packing group III performance level. Large packagings for waste aerosols transported in accordance with special provision 327 shall have in addition a means of retaining any free liquid that might escape during transport, e.g., absorbent material.				

LP99	PACKING INSTRUCTION	LP99
Only packagings which are approved for these goods by the competent authority may be used (see 4.1.3.7). A copy of the competent authority approval shall accompany each consignment or the transport document shall include an indication that the packaging was approved by the competent authority.		

LP101	PACKING INSTRUCTION	LP101
The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 and special provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Large packagings**
Not necessary	*Not necessary*	Steel (50A) Aluminium (50B) Metal other than steel or aluminium (50N) Rigid plastics (50H) Natural wood (50C) Plywood (50D) Reconstituted wood (50F) Rigid fibreboard (50G)
Special packing provision: **L1** For UN Nos. 0006, 0009, 0010, 0015, 0016, 0018, 0019, 0034, 0035, 0038, 0039, 0048, 0056, 0137, 0138, 0168, 0169, 0171, 0181, 0182, 0183, 0186, 0221, 0243, 0244, 0245, 0246, 0254, 0280, 0281, 0286, 0287, 0297, 0299, 0300, 0301, 0303, 0321, 0328, 0329, 0344, 0345, 0346, 0347, 0362, 0363, 0370, 0412, 0424, 0425, 0434, 0435, 0436, 0437, 0438, 0451, 0488 and 0502: Large and robust explosives articles, normally intended for military use, without their means of initiation or with their means of initiation containing at least two effective protective features, may be transported unpackaged. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of transport. A negative result in Test Series 4 on an unpackaged article indicates that the article can be considered for transport unpackaged. Such unpackaged articles may be fixed to cradles or contained in crates or other suitable handling devices.		

LP102	PACKING INSTRUCTION	LP102
The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 and special provisions of 4.1.5 are met.		
Inner packagings	**Intermediate packagings**	**Outer packagings**
Bags water-resistant **Receptacles** fibreboard metal plastics wood **Sheets** fibreboard, corrugated **Tubes** fibreboard	*Not necessary*	Steel (50A) Aluminium (50B) Metal other than steel or aluminium (50N) Rigid plastics (50H) Natural wood (50C) Plywood (50D) Reconstituted wood (50F) Rigid fibreboard (50G)

LP621	PACKING INSTRUCTION	LP621
This instruction applies to UN 3291.		
The following large packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met: (1) For clinical waste placed in inner packagings: Rigid, leakproof large packagings conforming to the provisions of chapter 6.6 for solids, at the packing group II performance level, provided there is sufficient absorbent material to absorb the entire amount of liquid present and the large packaging is capable of retaining liquids. (2) For packages containing larger quantities of liquid: Large rigid packagings conforming to the provisions of chapter 6.6, at the packing group II performance level, for liquids.		
Additional provision: Large packagings intended to contain sharp objects such as broken glass and needles shall be resistant to puncture and retain liquids under the performance test conditions in chapter 6.6.		

LP902	PACKING INSTRUCTION	LP902
This instruction applies to UN 3268.		
Packaged articles: The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met: Packagings conforming to the packing group III performance level. The packagings shall be designed and constructed to prevent movement of the articles and inadvertent operation during normal conditions of transport. Unpackaged articles: The articles may also be transported unpackaged in dedicated handling devices, vehicles, containers or wagons when moved from where they are manufactured to an assembly plant.		
Additional provision: Any pressure receptacle shall be in accordance with the requirements of the competent authority for the substance(s) contained in the pressure receptacle(s).		

4.1.5 Special packing provisions for goods of class 1

4.1.5.1 The general provisions of 4.1.1 shall be met.

4.1.5.2 All packagings for class 1 goods shall be so designed and constructed that:

.1 they will protect the explosives, prevent them escaping and cause no increase in the risk of unintended ignition or initiation when subjected to normal conditions of transport, including foreseeable changes in temperature, humidity and pressure;

.2 the complete package can be handled safely in normal conditions of transport; and

.3 the packages will withstand any loading imposed on them by foreseeable stacking to which they will be subject during transport so that they do not add to the risk presented by the explosives, the containment function of the packagings is not harmed, and they are not distorted in a way or to an extent which will reduce their strength or cause instability of a stack.

4.1.5.3 All explosive substances and articles, as prepared for transport, shall have been classified in accordance with the procedures detailed in 2.1.3.

4.1.5.4 Class 1 goods shall be packed in accordance with the appropriate packing instruction shown in columns 8 and 9 of the Dangerous Goods List, as detailed in 4.1.4.

4.1.5.5 Unless otherwise specified in this Code, packagings, including IBCs and large packagings, shall conform to the requirements of chapters 6.1, 6.5 or 6.6, as appropriate, and shall meet their test provisions for packing group II.

4.1.5.6 The closure device of packagings containing liquid explosives shall ensure a double protection against leakage.

4.1.5.7 The closure device of metal drums shall include a suitable gasket; if a closure device includes a screw-thread, the ingress of explosive substances into the screw-thread shall be prevented.

4.1.5.8 Packagings for water-soluble substances shall be water-resistant. Packagings for desensitized or phlegmatized substances shall be closed to prevent changes in concentration during transport.

4.1.5.9 When the packaging includes a double envelope filled with water which may freeze during transport, a sufficient quantity of an anti-freeze agent shall be added to the water to prevent freezing. Anti-freeze that could create a fire hazard because of its inherent flammability shall not be used.

4.1.5.10 Nails, staples and other closure devices made of metal without protective covering shall not penetrate to the inside of the outer packaging unless the inner packaging adequately protects the explosives against contact with the metal.

4.1.5.11 Inner packagings, fittings and cushioning materials and the placing of explosive substances or articles in packages shall be accomplished in a manner which prevents the explosive substances or articles from becoming loose in the outer packaging under normal conditions of transport. Metallic components of articles shall be prevented from making contact with metal packagings. Articles containing explosive substances not enclosed in an outer casing shall be separated from each other in order to prevent friction and impact. Padding, trays, partitioning in the inner or outer packaging, mouldings or receptacles may be used for this purpose.

4.1.5.12 Packagings shall be made of materials compatible with, and impermeable to, the explosives contained in the package, so that neither interaction between the explosives and the packaging materials nor leakage causes the explosive to become unsafe to transport, or the hazard division or compatibility group to change.

4.1.5.13 The ingress of explosive substances into the recesses of seamed metal packagings shall be prevented.

4.1.5.14 Plastics packagings shall not be liable to generate or accumulate sufficient static electricity so that a discharge could cause the packaged explosive substances or articles to initiate, ignite or function.

4.1.5.15 Large and robust explosives articles, normally intended for military use, without their means of initiation or with their means of initiation containing at least two effective protective features may be transported unpackaged. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of transport. A negative result in Test Series 4 on an unpackaged article indicates that the article can be considered for transport unpackaged. Such unpackaged articles may be fixed to cradles or contained in crates or other suitable handling, storage or launching devices in such a way that they will not become loose during normal conditions of transport. Where such large explosive articles are, as part of their operational safety and suitability tests, subjected to test regimes that meet the provisions of this Code and such tests have been successfully undertaken, the competent authority may approve such articles to be transported under this Code.

4.1.5.16 Explosive substances shall not be packed in inner or outer packagings where the differences in internal and external pressures, due to thermal or other effects, could cause an explosion or rupture of the package.

4.1.5.17 Whenever loose explosive substances or the explosive substance of an uncased or partly cased article may come into contact with the inner surface of metal packagings (1A1, 1A2, 1B1, 1B2, 4A, 4B and metal receptacles), the metal packaging shall be provided with an inner liner or coating (see 4.1.1.2).

4.1.5.18 Packing instruction P101 may be used for any explosive provided the package has been approved by a competent authority regardless of whether the packaging complies with the packing instruction assignment in the Dangerous Goods List.

4.1.5.19 Government-owned military dangerous goods, packaged prior to 1 January 1990 in accordance with the provisions of the IMDG Code in effect at that time, may be transported provided the packagings maintain their integrity and the goods are declared as government-owned goods packaged prior to 1 January 1990.

4.1.6 Special packing provisions for goods of class 2

4.1.6.1 General provisions

4.1.6.1.1 This section provides general requirements applicable to the use of pressure receptacles for the transport of class 2 gases and other dangerous goods in pressure receptacles (e.g. UN 1051 Hydrogen cyanide, stabilized). Pressure receptacles shall be constructed and closed so as to prevent any loss of contents which might be caused under normal conditions of transport, including by vibration, or by changes in temperature, humidity or pressure (resulting from change in altitude, for example).

4.1.6.1.2 Parts of pressure receptacles which are in direct contact with dangerous goods shall not be affected or weakened by those dangerous goods and shall not cause a dangerous effect (e.g. catalysing a reaction or reacting with the dangerous goods). The provisions of ISO 11114-1:1997 and ISO 11114-2:2000 shall be met as applicable.

4.1.6.1.3 Pressure receptacles, including their closures, shall be selected to contain a gas or a mixture of gases according to the requirements of 6.2.1.2 and the requirements of the specific packing instructions of 4.1.4.1. This section also applies to pressure receptacles which are elements of MEGCs.

4.1.6.1.4 Refillable pressure receptacles shall not be filled with a gas or gas mixture different from that previously contained unless the necessary operations for change of gas service have been performed. The change of service for compressed and liquefied gases shall be in accordance with ISO 11621:1997, as applicable. In addition, a pressure receptacle that previously contained a class 8 corrosive substance or a substance of another class with a corrosive subsidiary risk shall not be authorized for the transport of a class 2 substance unless the necessary inspection and testing as specified in 6.2.1.6 have been performed.

4.1.6.1.5 Prior to filling, the filler shall perform an inspection of the pressure receptacle and ensure that the pressure receptacle is authorized for the gas and, in case of a chemical under pressure, for the propellant to be transported and that the provisions of this Code have been met. Shut-off valves shall be closed after filling and remain closed during transport. The consignor shall verify that the closures and equipment are not leaking.

4.1.6.1.6 Pressure receptacles shall be filled according to the working pressures, filling ratios and provisions specified in the appropriate packing instruction for the specific substance being filled. Reactive gases and gas mixtures shall be filled to a pressure such that if complete decomposition of the gas occurs, the working pressure of the pressure receptacle shall not be exceeded. Bundles of cylinders shall not be filled in excess of the lowest working pressure of any given cylinder in the bundle.

4.1.6.1.7 Pressure receptacles, including their closures, shall conform to the design, construction, inspection and testing requirements detailed in chapter 6.2. When outer packagings are prescribed, the pressure receptacles shall be firmly secured therein. Unless otherwise specified in the detailed packing instructions, one or more inner packagings may be enclosed in an outer packaging.

4.1.6.1.8 Valves shall be designed and constructed in such a way that they are inherently able to withstand damage without release of the contents or shall be protected from damage which could cause inadvertent release of the contents of the pressure receptacle, by one of the following methods:

.1 Valves are placed inside the neck of the pressure receptacle and protected by a threaded plug or cap;

.2 Valves are protected by caps. Caps shall possess vent-holes of sufficient cross-sectional area to evacuate the gas if leakage occurs at the valves;

.3 Valves are protected by shrouds or guards;

.4 Pressure receptacles are transported in frames (e.g. bundles); or

.5 Pressure receptacles are transported in an outer packaging. The packaging as prepared for transport shall be capable of meeting the drop test specified in 6.1.5.3 at the packing group I performance level.

For pressure receptacles with valves as described in .2 and .3, the requirements of either ISO 11117:1998 or ISO 11117:2008 + Cor 1:2009 shall be met; for valves with inherent protection, the provisions of annex A of ISO 10297:2006 shall be met.

For metal hydride storage systems, the valve protection requirements specified in ISO 16111:2008 shall be met.

4.1.6.1.9 Non-refillable pressure receptacles shall:

.1 be transported in an outer packaging, such as a box, or crate, or in shrink-wrapped trays or stretch-wrapped trays;

.2 be of a water capacity less than or equal to 1.25 ℓ when filled with flammable or toxic gas;

.3 not be used for toxic gases with an LC_{50} less than or equal to 200 mℓ/m^3; and

.4 not be repaired after being put into service.

4.1.6.1.10 Refillable pressure receptacles, other than cryogenic receptacles, shall be periodically inspected in accordance with 6.2.1.6 and packing instruction P200, P205 or P206, as applicable. Pressure relief valves for closed cryogenic receptacles shall be subject to periodic inspections and tests according to the provisions of 6.2.1.6.3 and packing instruction P203. Pressure receptacles shall not be filled after they become due for periodic inspection but may be transported after the expiry of the time limit.

4.1.6.1.11 Repairs shall be consistent with the manufacture and testing requirements of the applicable design and construction standards and are only permitted as indicated in the relevant periodic inspection standards specified in 6.2.2.4. Pressure receptacles, other than the jacket of closed cryogenic receptacles, shall not be subjected to repairs of any of the following:

.1 weld cracks or other weld defects;

.2 cracks in walls;

.3 leaks or defects in the material of the wall, head or bottom.

4.1.6.1.12 Pressure receptacles shall not be offered for filling:

.1 when damaged to such an extent that the integrity of the pressure receptacle or its service equipment may be affected;

.2 unless the pressure receptacle and its service equipment has been examined and found to be in good working order; or

.3 unless the required certification, retest, and filling markings are legible.

4.1.6.1.13 Filled pressure receptacles shall not be offered for transport:

.1 when leaking;

.2 when damaged to such an extent that the integrity of the pressure receptacle or its service equipment may be affected;

.3 unless the pressure receptacle and its service equipment has been examined and found to be in good working order; or

.4 unless the required certification, retest, and filling markings are legible.

4.1.6.1.14 Where in packing instruction P200 cylinders and other pressure receptacles for gases conforming to the requirements of this sub-section and chapter 6.2 are authorized, use is also authorized of cylinders and pressure receptacles which conform to the requirements of the competent authority of the country in which the cylinder or pressure receptacle is filled. Valves shall be suitably protected. Pressure receptacles with capacities of 1 ℓ or less shall be packed in outer packagings constructed of suitable material of adequate strength and design in relation to the capacity of the packaging and its intended use and secured or cushioned so as to prevent significant movement within the outer packaging during normal conditions of transport.

4.1.7 Special packing provisions for organic peroxides (class 5.2) and self-reactive substances of class 4.1

4.1.7.0 General

4.1.7.0.1 For organic peroxides, all receptacles shall be “effectively closed”. Where significant internal pressure may develop in a package by the evolution of gas, a vent may be fitted, provided the gas emitted will not cause danger, otherwise the degree of filling shall be limited. Any venting device shall be so constructed that liquid will not escape when the package is in an upright position and it shall be able to prevent ingress of impurities. The outer packaging, if any, shall be so designed as not to interfere with the operation of the venting device.

4.1.7.1 Use of packagings (except IBCs)

4.1.7.1.1 Packagings for organic peroxides and self-reactive substances shall conform to the provisions of chapter 6.1 and shall meet its test provisions for packing group II.

4.1.7.1.2 The packing methods for organic peroxides and self-reactive substances are listed in packing instruction P520 and are designated OP1 to OP8. The quantities specified for each packing method are the maximum quantities authorized per package.

4.1.7.1.3 The packing methods appropriate for the individual currently assigned self-reactive substances and organic peroxides are listed in 2.4.2.3.2.3 and 2.5.3.2.4.

4.1.7.1.4 For new organic peroxides, new self-reactive substances or new formulations of currently assigned organic peroxides or self-reactive substances, the following procedure shall be used to assign the appropriate packing method:

.1 ORGANIC PEROXIDE TYPE B or SELF-REACTIVE SUBSTANCE TYPE B:
Packing method OP5 shall be assigned, provided that the organic peroxide (or self-reactive substance) satisfies the criteria of 2.5.3.3.2.2 (resp. 2.4.2.3.3.2.2) in a packaging authorized by the packing method. If the organic peroxide (or self-reactive substance) can only satisfy these criteria in a smaller packaging than those authorized by packing method OP5 (viz. one of the packagings listed for OP1 to OP4), then the corresponding packing method with the lower OP number is assigned;

.2 ORGANIC PEROXIDE TYPE C or SELF-REACTIVE SUBSTANCE TYPE C:
Packing method OP6 shall be assigned, provided that the organic peroxide (or self-reactive substance) satisfies the criteria of 2.5.3.3.2.3 (resp. 2.4.2.3.3.2.3) in packaging authorized by the packing method. If the organic peroxide (or self-reactive substance) can only satisfy these criteria in a smaller packaging than those authorized by packing method OP6, then the corresponding packing method with the lower OP number is assigned;

.3 ORGANIC PEROXIDE TYPE D or SELF-REACTIVE SUBSTANCE TYPE D:
Packing method OP7 shall be assigned to this type of organic peroxide or self-reactive substance;

.4 ORGANIC PEROXIDE TYPE E or SELF-REACTIVE SUBSTANCE TYPE E:
Packing method OP8 shall be assigned to this type of organic peroxide or self-reactive substance;

.5 ORGANIC PEROXIDE TYPE F or SELF-REACTIVE SUBSTANCE TYPE F:
Packing method OP8 shall be assigned to this type of organic peroxide or self-reactive substance.

4.1.7.2 Use of intermediate bulk containers

4.1.7.2.1 The currently assigned organic peroxides specifically listed in packing instruction IBC520 may be transported in IBCs in accordance with this packing instruction. IBCs shall conform to the requirements of chapter 6.5 and shall meet its test provisions for packing group II.

4.1.7.2.2 Other organic peroxides and self-reactive substances of type F may be transported in IBCs under conditions established by the competent authority of the country of origin when, on the basis of the appropriate tests, that competent authority is satisfied that such transport may be safely conducted. The tests undertaken shall include those necessary:

.1 to prove that the organic peroxide (or self-reactive substance) complies with the principles for classification;

.2 to prove the compatibility of all materials normally in contact with the substance during the transport;

.3 to determine, when applicable, the control and emergency temperatures associated with the transport of the product in the IBC concerned as derived from the SADT;

.4 to design, when applicable, pressure and emergency relief devices; and

.5 to determine if any special provisions are necessary for safe transport of the substance.

4.1.7.2.3 For self-reactive substances, temperature control is required according to 2.4.2.3.4. For organic peroxides, temperature control is required according to 2.5.3.4.1. Temperature control provisions are given in 7.3.7.

4.1.7.2.4 Emergencies to be taken into account are self-accelerating decomposition and fire engulfment. To prevent explosive rupture of metal or composite IBCs with a complete metal casing, the emergency relief devices shall be designed to vent all the decomposition products and vapours evolved during self-accelerating decomposition or during a period of not less than one hour of complete fire engulfment calculated by the equations given in 4.2.1.13.8.

4.1.8 Special packing provisions for infectious substances of category A (class 6.2, UN 2814 and UN 2900)

4.1.8.1 Consignors of infectious substances shall ensure that packages are prepared in such a manner that they arrive at their destination in good condition and present no hazard to persons or animals during transport.

4.1.8.2 The definitions in 1.2.1 and the general packing provisions of 4.1.1.1 to 4.1.1.14, except 4.1.1.10 to 4.1.1.12, apply to infectious substances packages. However, liquids shall only be filled into packagings which have an appropriate resistance to the internal pressure that may develop under normal conditions of transport.

4.1.8.3 An itemized list of contents shall be enclosed between the secondary packaging and the outer packaging. When the infectious substances to be transported are unknown, but suspected of meeting the criteria for inclusion in category A, the words “suspected category A infectious substance” shall be shown, in parentheses, following the Proper Shipping Name on the document inside the outer packaging.

4.1.8.4 Before an empty packaging is returned to the consignor, or sent elsewhere, it shall be disinfected or sterilized to nullify any hazard and any label or marking indicating that it had contained an infectious substance shall be removed or obliterated.

4.1.8.5 Provided an equivalent level of performance is maintained, the following variations in the primary receptacles placed within an intermediate packaging are allowed without further testing of the completed package:

.1 Primary receptacles of equivalent or smaller size as compared to the tested primary receptacles may be used provided:

(a) the primary receptacles are of similar design to the tested primary receptacle (such as shape: round, rectangular, etc.);

(b) the material of construction of the primary receptacle (glass, plastics, metal, etc.) offers resistance to impact and stacking forces equal to or greater than that of the originally tested primary receptacle;

(c) the primary receptacles have the same or smaller openings and the closure is of similar design (such as screw cap, friction lid, etc.);

(d) sufficient additional cushioning material is used to take up void spaces and to prevent significant movement of the primary receptacles; and

(e) primary receptacles are oriented within the intermediate packaging in the same manner as in the tested package.

.2 A lesser number of the tested primary receptacles, or of the alternative types of primary receptacles identified in .1 above, may be used provided sufficient cushioning is added to fill the void space(s) and to prevent significant movement of the primary receptacles.

4.1.9 Special packing provisions for class 7

4.1.9.1 General

4.1.9.1.1 Radioactive material, packagings and packages shall meet the provisions of chapter 6.4. The quantity of radioactive material in a package shall not exceed the limits specified in 2.7.2.2, 2.7.2.4.1, 2.7.2.4.4, 2.7.2.4.5, 2.7.2.4.6 and 4.1.9.3.

The types of packages for radioactive materials covered by the provisions of this Code are:

.1 Excepted package (see 1.5.1.5);

.2 Industrial package Type 1 (Type IP-1 package);

.3 Industrial package Type 2 (Type IP-2 package);

.4 Industrial package Type 3 (Type IP-3 package);

.5 Type A package;

.6 Type B(U) package;

.7 Type B(M) package;

.8 Type C package.

Packages containing fissile material or uranium hexafluoride are subject to additional requirements.

4.1.9.1.2 The non-fixed contamination on the external surfaces of any package shall be kept as low as practicable and, under routine conditions of transport, shall not exceed the following limits:

(a) 4 Bq/cm^2 for beta and gamma emitters and low-toxicity alpha emitters, and

(b) 0.4 Bq/cm^2 for all other alpha emitters.

These limits are applicable when averaged over any area of 300 cm^2 of any part of the surface.

4.1.9.1.3 A package, other than an excepted package, shall not contain any items other than those that are necessary for the use of the radioactive material. The interaction between these items and the package under the conditions of transport applicable to the design shall not reduce the safety of the package.

4.1.9.1.4 Except as provided in 7.1.4.5.11, the level of non-fixed contamination on the external and internal surfaces of overpacks, cargo transport units, tanks, IBCs and conveyances shall not exceed the limits specified in 4.1.9.1.2.

4.1.9.1.5 For radioactive material having other dangerous properties the package design shall take into account those properties. Radioactive material with a subsidiary risk, packaged in packages that do not require competent authority approval, shall be transported in packagings, IBCs, tanks or bulk containers fully complying with the provisions of the relevant chapters of part 6 as appropriate, as well as applicable provisions of chapters 4.1, 4.2 or 4.3 for that subsidiary risk.

4.1.9.1.6 Before the first shipment of any package, the following provisions shall be fulfilled:

.1 If the design pressure of the containment system exceeds 35 kPa (gauge), it shall be ensured that the containment system of each package conforms to the approved design requirements relating to the capability of that system to maintain its integrity under that pressure;

.2 For each Type B(U), Type B(M) and Type C package and for each package containing fissile material, it shall be ensured that the effectiveness of its shielding and containment and, where necessary, the heat transfer characteristics and the effectiveness of the confinement system are within the limits applicable to or specified for the approved design;

.3 For packages containing fissile material, where, in order to comply with the requirements of 6.4.11.1, neutron poisons are specifically included as components of the package, checks shall be performed to confirm the presence and distribution of those neutron poisons.

4.1.9.1.7 Before each shipment of any package, the following provisions shall be fulfilled:

.1 For any package, it shall be ensured that all provisions specified in the relevant provisions of this Code have been satisfied;

.2 It shall be ensured that lifting attachments which do not meet the requirements of 6.4.2.2 have been removed or otherwise rendered incapable of being used for lifting the package, in accordance with 6.4.2.3;

.3 For each package requiring competent authority approval, it shall be ensured that all the requirements specified in the approval certificates have been satisfied;

.4 Each Type B(U), Type B(M) and Type C package shall be held until equilibrium conditions have been approached closely enough to demonstrate compliance with the requirements for temperature and pressure unless an exemption from these requirements has received unilateral approval;

.5 For each Type B(U), Type B(M) and Type C package, it shall be ensured by inspection and/or appropriate tests that all closures, valves, and other openings of the containment system through which the radioactive contents might escape are properly closed and, where appropriate, sealed in the manner for which the demonstrations of compliance with the requirements of 6.4.8.8 and 6.4.10.3 were made;

.6 For each special form radioactive material, it shall be ensured that all the provisions specified in the approval certificate and the relevant provisions of this Code have been satisfied;

.7 For packages containing fissile material, the measurement specified in 6.4.11.4(b) and the tests to demonstrate closure of each package as specified in 6.4.11.7 shall be performed where applicable;

.8 For each low dispersible radioactive material, it shall be ensured that all the requirements specified in the approval certificate and the relevant provisions of this Code have been satisfied.

4.1.9.1.8 The consignor shall also have a copy of any instructions with regard to the proper closing of the package and any preparation for shipment before making any shipment under the terms of the certificates.

4.1.9.1.9 Except for consignments under exclusive use, the transport index of any package or overpack shall not exceed 10, nor shall the criticality safety index of any package or overpack exceed 50.

4.1.9.1.10 Except for packages or overpacks transported under exclusive use by rail or by road under the conditions specified in 7.1.4.5.5.1, or under exclusive use and special arrangement by ship under the conditions specified in 7.1.4.5.7, the maximum radiation level at any point on any external surface of a package or overpack shall not exceed 2 mSv/h.

4.1.9.1.11 The maximum radiation level at any point on any external surface of a package or overpack under exclusive use shall not exceed 10 mSv/h.

4.1.9.1.12 Pyrophoric radioactive material shall be packaged in Type A, Type B(U), Type B(M) or Type C packages and shall also be suitably inerted.

4.1.9.2 Provisions and controls for transport of LSA material and SCO

4.1.9.2.1 The quantity of LSA material or SCO in a single Type IP-1 package, Type IP-2 package, Type IP-3 package, or object or collection of objects, whichever is appropriate, shall be so restricted that the external radiation level at 3 m from the unshielded material or object or collection of objects does not exceed 10 mSv/h.

4.1.9.2.2 For LSA material and SCO which is or contains fissile material, the applicable provisions of 6.4.11.1, 7.1.4.5.15 and 7.1.4.5.16 shall be met.

4.1.9.2.3 LSA material and SCO in groups LSA-I and SCO-I may be transported unpackaged under the following conditions:

.1 all unpackaged material other than ores containing only naturally occurring radionuclides shall be transported in such a manner that, under routine conditions of transport, there will be no escape of the radioactive contents from the conveyance nor will there be any loss of shielding;

.2 each conveyance shall be under exclusive use, except when only transporting SCO-I on which the contamination on the accessible and the inaccessible surfaces is not greater than ten times the applicable level specified in 2.7.1.2; and

.3 for SCO-I where it is suspected that non-fixed contamination exists on inaccessible surfaces in excess of the values specified in 2.7.2.3.2.1(i), measures shall be taken to ensure that the radioactive material is not released into the conveyance.

4.1.9.2.4 LSA material and SCO, except as otherwise specified in 4.1.9.2.3, shall be packaged in accordance with table 4.1.9.2.4.

Table 4.1.9.2.4 – Industrial package provisions for LSA material and SCO

Radioactive contents	Industrial package type	
	Exclusive use	Not under exclusive use
LSA-I		
Solid[a]	Type IP-1	Type IP-1
Liquid	Type IP-1	Type IP-2
LSA-II		
Solid	Type IP-2	Type IP-2
Liquid and gas	Type IP-2	Type IP-3
LSA-III	Type IP-2	Type IP-3
SCO-I[a]	Type IP-1	Type IP-1
SCO-II	Type IP-2	Type IP-2

[a] Under the conditions specified in 4.1.9.2.3, LSA-I material and SCO-I may be transported unpackaged.

4.1.9.3 Packages containing fissile material

Unless not classified as fissile in accordance with 2.7.2.3.5, packages containing fissile material shall not contain:

.1 A mass of fissile material (or mass of each fissile nuclide for mixtures when appropriate) different from that authorized for the package design;

.2 Any radionuclide or fissile material different from those authorized for the package design; or

.3 Contents in a form or physical or chemical state, or in a spatial arrangement, different from those authorized for the package design,

as specified in their certificates of approval where appropriate.

Chapter 4.2

Use of portable tanks and multiple-element gas containers (MEGCs)

The provisions of this chapter also apply to road tank vehicles to the extent indicated in chapter 6.8.

4.2.0 Transitional provisions

4.2.0.1 The provisions for the use and construction of portable tanks in this chapter and chapter 6.7 are based on the United Nations Recommendations on the transport of dangerous goods. IMO type portable tanks and road tank vehicles certified and approved prior to 1 January 2003 in accordance with the provisions of the IMDG Code in force on 1 July 1999 (amendment 29) may continue to be used provided that they are found to meet the applicable periodic inspections and test provisions. They shall meet the provisions set out in columns (13) and (14) of chapter 3.2. Detailed explanation and construction provisions may be found in DSC/Circ.12 (Guidance on the continued use of existing IMO type portable tanks and road tank vehicles for the transport of dangerous goods).

Note: For ease of reference, the following descriptions of existing IMO type tanks are included:
IMO type 1 tank means a portable tank for the transport of substances of classes 3 to 9 fitted with pressure-relief devices, having a maximum allowable working pressure of 1.75 bar and above.
IMO type 2 tank means a portable tank fitted with pressure-relief devices, having a maximum allowable working pressure equal to or above 1.0 bar but below 1.75 bar, intended for the transport of certain dangerous liquids of low hazard and certain solids.
IMO type 4 tank means a road tank vehicle for the transport of dangerous goods of classes 3 to 9 and includes a semi-trailer with a permanently attached tank or a tank attached to a chassis, with at least four twist locks which comply with ISO standards, (e.g. ISO International Standard 1161:1984).
IMO type 5 tank means a portable tank fitted with pressure-relief devices which is used for non-refrigerated gases of class 2.
IMO type 6 tank means a road tank vehicle for the transport of non-refrigerated liquefied gases of class 2 and includes a semi-trailer with a permanently attached tank or a tank attached to a chassis which is fitted with items of service equipment and structural equipment necessary for the transport of gases.
IMO type 7 tank means a thermally insulated portable tank fitted with items of service and structural equipment necessary for the transport of refrigerated liquefied gases. The portable tank shall be capable of being transported, loaded and discharged without the need of removal of its structural equipment, and shall be capable of being lifted when full. It shall not be permanently secured on board the ship.
IMO type 8 tank means a road tank vehicle for the transport of refrigerated liquefied gases of class 2 and includes a semi-trailer with a permanently attached thermally insulated tank fitted with items of service equipment and structural equipment necessary for the transport of refrigerated liquefied gases.

Note: IMO type 4, 6 and 8 road tank vehicles may be constructed after 1 January 2003 in accordance with the provisions of chapter 6.8.

4.2.0.2 UN portable tanks and MEGCs constructed according to a design approval certificate which has been issued before 1 January 2008 may continue to be used provided that they are found to meet the applicable periodic inspection and test provisions.

4.2.0.3 Portable tanks and MEGCs manufactured before 1 January 2012, that conform to the marking provisions of 6.7.2.20.1, 6.7.3.16.1, 6.7.4.15.1 or 6.7.5.13.1 of the IMDG Code in force on 1 January 2010 (amendment 34-08), as relevant, may continue to be used if they comply with all other relevant provisions of the current edition of the Code including, when applicable, the requirement of 6.7.2.20.1 (g) for marking the symbol "S" on the plate when the shell or the compartment is divided by surge plates into sections of not more than 7500 litres capacity. When the shell, or the compartment, was already divided by surge plates into sections of not more than 7500 litres capacity before 1 January 2012, the capacity of the shell, or respectively of the compartment, need not be supplemented with the symbol "S" until the next periodic inspection or test according to 6.7.2.19.5 is performed.

Portable tanks manufactured before 1 January 2014 need not be marked with the portable tank instruction as required in 6.7.2.20.2, 6.7.3.16.2 and 6.7.4.15.2 until the next periodic inspection and test.

Portable tanks and MECGs manufactured before 1 January 2014 need not comply with the requirements of 6.7.2.13.1.6, 6.7.3.9.1.5, 6.7.4.8.1.5 and 6.7.5.6.1 (d) concerning the marking of the pressure relief devices.

4.2.1 General provisions for the use of portable tanks for the transport of substances of class 1 and classes 3 to 9

4.2.1.1 This section provides general provisions applicable to the use of portable tanks for the transport of substances of classes 1, 3, 4, 5, 6, 7, 8 and 9. In addition to these general provisions, portable tanks shall conform to the design, construction, inspection and testing provisions detailed in 6.7.2. Substances shall be transported in portable tanks conforming to the applicable portable tank instruction and the portable tank special provisions assigned to each substance in the Dangerous Goods List.

4.2.1.2 During transport, portable tanks shall be adequately protected against damage to the shell and service equipment resulting from lateral and longitudinal impact and overturning. If the shell and service equipment are so constructed as to withstand impact or overturning, it need not be protected in this way. Examples of such protection are given in 6.7.2.17.5.

4.2.1.3 Certain substances are chemically unstable. They are accepted for transport only when the necessary steps have been taken to prevent their dangerous decomposition, transformation or polymerization during transport. To this end, care shall in particular be taken to ensure that shells do not contain any substances liable to promote these reactions.

4.2.1.4 The temperature of the outer surface of the shell, excluding openings and their closures, or of the thermal insulation shall not exceed 70°C during transport. When necessary, the shell shall be thermally insulated.

4.2.1.5 Empty portable tanks not cleaned and not gas-free shall comply with the same provisions as portable tanks filled with the previous substance.

4.2.1.6 Substances shall not be transported in adjoining compartments of shells when they may react dangerously with each other and cause:

.1 combustion and/or evolution of considerable heat;

.2 evolution of flammable, toxic or asphyxiant gases;

.3 the formation of corrosive substances;

.4 the formation of unstable substances;

.5 dangerous rise in pressure.

4.2.1.7 The design approval certificate, the test report and the certificate showing the results of the initial inspection and test for each portable tank issued by the competent authority or its authorized body shall be retained by the authority or body and the owner. Owners shall be able to provide this documentation upon the request of any competent authority.

4.2.1.8 Unless the name of the substance(s) being transported appears on the metal plate described in 6.7.2.20.2, a copy of the certificate specified in 6.7.2.18.1 shall be made available upon the request of a competent authority or its authorized body and readily provided by the consignor, consignee or agent, as appropriate.

4.2.1.9 Degree of filling

4.2.1.9.1 Prior to filling, the shipper shall ensure that the appropriate portable tank is used and that the portable tank is not loaded with substances which, in contact with the materials of the shell, gaskets, service equipment and any protective linings, are likely to react dangerously with them to form dangerous products or appreciably weaken these materials. The shipper may need to consult the manufacturer of the substance in conjunction with the competent authority for guidance on the compatibility of the substance with the portable tank materials.

4.2.1.9.1.1 Portable tanks shall not be filled in excess of the maximum degree of filling specified in 4.2.1.9.2 to 4.2.1.9.6. The applicability of 4.2.1.9.2, 4.2.1.9.3 or 4.2.1.9.5.1 to individual substances is specified in the applicable portable tank instructions or special provisions in 4.2.5.2.6 or 4.2.5.3 and columns 13 and 14 of the Dangerous Goods List.

4.2.1.9.2 The maximum degree of filling (in %) for general use is determined by the formula:

$$\text{Degree of filling} = \frac{97}{1 + \alpha(t_r - t_f)}$$

4.2.1.9.3 The maximum degree of filling (in %) for liquids of class 6.1 and class 8, in packing groups I and II, and liquids with an absolute vapour pressure of more than 175 kPa (1.75 bar) at 65°C, or for liquids identified as marine pollutants is determined by the formula:

$$\text{Degree of filling} = \frac{95}{1 + \alpha(t_r - t_f)}$$

4.2.1.9.4 In these formulae, α is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (t_f) and the maximum mean bulk temperature during transport (t_r) (both in °C). For liquids transported under ambient conditions, α could be calculated by the formula:

$$\alpha = \frac{d_{15} - d_{50}}{35\ d_{50}}$$

in which d_{15} *and* d_{50} are the densities of the liquid at 15°C and 50°C, respectively.

4.2.1.9.4.1 The maximum mean bulk temperature (t_r) shall be taken as 50°C except that, for journeys under temperate or extreme climatic conditions, the competent authorities concerned may agree to a lower or require a higher temperature, as appropriate.

4.2.1.9.5 The provisions of 4.2.1.9.2 to 4.2.1.9.4.1 do not apply to portable tanks which contain substances maintained at a temperature above 50°C during transport (such as by means of a heating device). For portable tanks equipped with a heating device, a temperature regulator shall be used to ensure the maximum degree of filling is not more than 95% full at any time during transport.

4.2.1.9.5.1 The maximum degree of filling (in %) for solids transported above their melting points and for elevated temperature liquids shall be determined by the following formula:

$$\text{Degree of filling} = 95\frac{d_r}{d_f}$$

in which d_f *and* d_r are the densities of the liquid at the mean temperature of the liquid during filling and the maximum mean bulk temperature during transport respectively.

4.2.1.9.6 Portable tanks shall not be offered for transport:

.1 with a degree of filling, for liquids having a viscosity less than 2,680 mm^2/s at 20°C or at the maximum temperature of the substance during transport in the case of a heated substance, of more than 20% but less than 80% unless the shells of portable tanks are divided, by partitions or surge plates, into sections of not more than 7,500 ℓ capacity;

.2 with residue of substances previously transported adhering to the outside of the shell or service equipment;

.3 when leaking or damaged to such an extent that the integrity of the portable tank or its lifting or securing arrangements may be affected; and

.4 unless the service equipment has been examined and found to be in good working order.

For certain dangerous substances, a lower degree of filling may be required.

4.2.1.9.7 Forklift pockets of portable tanks shall be closed off where the tank is filled. This provision does not apply to portable tanks which, according to 6.7.2.17.4, need not be provided with a means of closing off the forklift pockets.

4.2.1.9.8 Portable tanks shall not be filled or discharged while they remain on board.

4.2.1.10 Additional provisions applicable to the transport of class 3 substances in portable tanks

All portable tanks intended for the transport of flammable liquids shall be closed and be fitted with relief devices in accordance with 6.7.2.8 to 6.7.2.15.

4.2.1.11 Additional provisions applicable to the transport of class 4 substances (other than class 4.1 self-reactive substances) in portable tanks

[Reserved]

Note: For class 4.1 self-reactive substances, see 4.2.1.13.

4.2.1.12 Additional provisions applicable to the transport of class 5.1 substances in portable tanks

[Reserved]

4.2.1.13 Additional provisions applicable to the transport of class 5.2 substances and class 4.1 self-reactive substances in portable tanks

4.2.1.13.1 Each substance shall have been tested and a report submitted to the competent authority of the country of origin for approval. Notification thereof shall be sent to the competent authority of the country of destination. The notification shall contain relevant transport information and the report with test results. The tests undertaken shall include those necessary:

.1 to prove the compatibility of all materials normally in contact with the substance during transport;

.2 to provide data for the design of the pressure and emergency relief devices, taking into account the design characteristics of the portable tank.

Any additional provisions necessary for safe transport of the substance shall be clearly described in the report.

4.2.1.13.2 The following provisions apply to portable tanks intended for the transport of type F organic peroxides or type F self-reactive substances with a self-accelerating decomposition temperature (SADT) of 55°C or more. In case of conflict, these provisions prevail over those specified in 6.7.2. Emergencies to be taken into account are self-accelerating decomposition of the substance and fire-engulfment as described in 4.2.1.13.8.

4.2.1.13.3 The additional provisions for transport of organic peroxides or self-reactive substances with an SADT less than 55°C in portable tanks shall be specified by the competent authority of the country of origin. Notification thereof shall be sent to the competent authority of the country of destination.

4.2.1.13.4 The portable tank shall be designed for a test pressure of at least 0.4 MPa (4 bar).

4.2.1.13.5 Portable tanks shall be fitted with temperature-sensing devices.

4.2.1.13.6 Portable tanks shall be fitted with pressure-relief devices and emergency relief devices. Vacuum-relief devices may also be used. Pressure-relief devices shall operate at pressures determined according to both the properties of the substance and the construction characteristics of the portable tank. Fusible elements are not allowed in the shell.

4.2.1.13.7 The pressure-relief devices shall consist of spring-loaded valves fitted to prevent significant build-up within the portable tank of the decomposition products and vapours released at a temperature of 50°C. The capacity and start-to-discharge pressure of the relief valves shall be based on the results of the tests specified in 4.2.1.13.1. The start-to-discharge pressure shall, however, in no case be such that liquid would escape from the valve(s) if the portable tank were overturned.

4.2.1.13.8 The emergency relief devices may be of the spring-loaded or frangible types, or a combination of the two, designed to vent all the decomposition products and vapours evolved during a period of not less than one hour of complete fire-engulfment as calculated by the following formula:

$$q = 70961FA^{0.82}$$

where:

q = heat absorption (W)
A = wetted area (m^2)
F = insulation factor;

$F =$ 1 for non-insulated vessels, or

$F = \dfrac{U\,(923 - T)}{47032}$ for insulated shells

where:

K	=	heat conductivity of insulation layer	($W{\cdot}m^{-1}{\cdot}K^{-1}$)
L	=	thickness of insulation layer	(m)
U	=	K/L = heat transfer coefficient of the insulation	($W{\cdot}m^{-2}{\cdot}K^{-1}$)
T	=	temperature of substance at relieving conditions	(K)

The start-to-discharge pressure of the emergency relief device(s) shall be higher than that specified in 4.2.1.13.7 and based on the results of the tests referred to in 4.2.1.13.1. The emergency relief devices shall be dimensioned in such a way that the maximum pressure in the tank never exceeds the test pressure of the portable tank.

Note: An example of a method to determine the size of emergency relief devices is given in Appendix 5 of the *Manual of Tests and Criteria*.

4.2.1.13.9 For insulated portable tanks, the capacity and setting of emergency relief device(s) shall be determined assuming a loss of insulation from 1% of the surface area.

4.2.1.13.10 Vacuum-relief devices and spring-loaded valves shall be provided with flame arresters. Due attention shall be paid to the reduction of the relief capacity caused by the flame arrester.

4.2.1.13.11 Service equipment such as valves and external piping shall be so arranged that no substance remains in them after filling the portable tank.

4.2.1.13.12 Portable tanks may be either insulated or protected by a sunshield. If the SADT of the substance in the portable tank is 55°C or less, or the portable tank is constructed of aluminium, the portable tank shall be completely insulated. The outer surface shall be finished in white or bright metal.

4.2.1.13.13 The degree of filling shall not exceed 90% at 15°C.

4.2.1.13.14 The marking as required in 6.7.2.20.2 shall include the UN Number and the technical name with the approved concentration of the substance concerned.

4.2.1.13.15 Organic peroxides and self-reactive substances specifically listed in portable tank instruction T23 in 4.2.5.2.6 may be transported in portable tanks.

4.2.1.14 Additional provisions applicable to the transport of class 6.1 substances in portable tanks

[Reserved]

4.2.1.15 Additional provisions applicable to the transport of class 6.2 substances in portable tanks

[Reserved]

4.2.1.16 Additional provisions applicable to the transport of class 7 substances in portable tanks

4.2.1.16.1 Portable tanks used for the transport of radioactive material shall not be used for the transport of other goods.

4.2.1.16.2 The degree of filling for portable tanks shall not exceed 90% or, alternatively, any other value approved by the competent authority.

4.2.1.17 Additional provisions applicable to the transport of class 8 substances in portable tanks

4.2.1.17.1 Pressure-relief devices of portable tanks used for the transport of class 8 substances shall be inspected at intervals not exceeding one year.

4.2.1.18 Additional provisions applicable to the transport of class 9 substances in portable tanks

[Reserved]

4.2.1.19 Additional provisions applicable to the transport of solid substances transported above their melting point

4.2.1.19.1 Solid substances transported or offered for transport above their melting point which are not assigned a portable tank instruction in column 13 of the Dangerous Goods List of chapter 3.2 or when the assigned portable tank instruction does not apply to transport at temperatures above their melting point may be transported in portable tanks provided that the solid substances are classified in classes 4.1, 4.2, 4.3, 5.1, 6.1, 8 or 9 and have no subsidiary risk other than that of class 6.1 or class 8 and are in packing group II or III.

4.2.1.19.2 Unless otherwise indicated in the Dangerous Goods List, portable tanks used for the transport of these solid substances above their melting point shall conform to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II. A portable tank that affords an equivalent or greater level of safety may be selected in accordance with 4.2.5.2.5. The maximum degree of filling (in %) shall be determined according to 4.2.1.9.5 (TP3).

4.2.2 General provisions for the use of portable tanks for the transport of non-refrigerated liquefied gases and chemicals under pressure

4.2.2.1 This section provides general provisions applicable to the use of portable tanks for the transport of non-refrigerated liquefied gases of class 2 and chemicals under pressure.

4.2.2.2 Portable tanks shall conform to the design, construction, inspection and testing provisions detailed in 6.7.3. Non-refrigerated liquefied gases and chemicals under pressure shall be transported in portable tanks conforming to portable tank instruction T50 as described in 4.2.5.2.6 and any portable tank special provisions assigned to specific non-refrigerated liquefied gases in the Dangerous Goods List and described in 4.2.5.3.

4.2.2.3 During transport, portable tanks shall be adequately protected against damage to the shell and service equipment resulting from lateral and longitudinal impact and overturning. If the shell and service equipment are so constructed as to withstand impact or overturning, it need not be protected in this way. Examples of such protection are given in 6.7.3.13.5.

4.2.2.4 Certain non-refrigerated liquefied gases are chemically unstable. They are accepted for transport only when the necessary steps have been taken to prevent their dangerous decomposition, transformation or polymerization during transport. To this end, care shall be taken to ensure that portable tanks do not contain any non-refrigerated liquefied gases liable to promote these reactions.

4.2.2.5 Unless the name of the gas(es) being transported appears on the metal plate described in 6.7.3.16.2, a copy of the certificate specified in 6.7.3.14.1 shall be made available upon a competent authority request and readily provided by the consignor, consignee or agent, as appropriate.

4.2.2.6 Empty portable tanks not cleaned and not gas-free shall comply with the same provisions as portable tanks filled with the previous non-refrigerated liquefied gas.

4.2.2.7 **Filling**

4.2.2.7.1 Prior to filling, the shipper shall ensure that the portable tank is approved for the non-refrigerated liquefied gas or the propellant of the chemical under pressure to be transported and that the portable tank is not loaded with non-refrigerated liquefied gases, or with chemicals under pressure which, in contact with the materials of the shell, gaskets and service equipment, are likely to react dangerously with them to form dangerous products or appreciably weaken these materials. During filling, the temperature of the non-refrigerated liquefied gas or propellant of chemicals under pressure shall fall within the limits of the design temperature range.

4.2.2.7.2 The maximum mass of non-refrigerated liquefied gas per litre of shell capacity (kg/ℓ) shall not exceed the density of the non-refrigerated liquefied gas at 50°C multiplied by 0.95. Furthermore, the shell shall not be liquid-full at 60°C.

4.2.2.7.3 Portable tanks shall not be filled above their maximum permissible gross mass and the maximum permissible load mass specified for each gas to be transported.

4.2.2.7.4 Portable tanks shall not be filled or discharged while they remain on board.

4.2.2.8 Portable tanks shall not be offered for transport:

.1 in an ullage condition liable to produce an unacceptable hydraulic force due to surge within the portable tank;

.2 when leaking;

.3 when damaged to such an extent that the integrity of the tank or its lifting or securing arrangements may be affected; and

.4 unless the service equipment has been examined and found to be in good working order.

4.2.2.9 Forklift pockets of portable tanks shall be closed off when the tank is filled. This provision does not apply to portable tanks which, according to 6.7.3.13.4, need not be provided with a means of closing off the forklift pockets.

4.2.3 General provisions for the use of portable tanks for the transport of refrigerated liquefied gases of class 2

4.2.3.1 This section provides general provisions applicable to the use of portable tanks for the transport of refrigerated liquefied gases.

4.2.3.2 Portable tanks shall conform to the design, construction, inspection and testing provisions detailed in 6.7.4. Refrigerated liquefied gases shall be transported in portable tanks conforming to portable tank instruction T75 as described in 4.2.5.2.6 and the portable tank special provisions assigned to each substance in columns 12 and 14 of the Dangerous Goods List and described in 4.2.5.3.

4.2.3.3 During transport, portable tanks shall be adequately protected against damage to the shell and service equipment resulting from lateral and longitudinal impact and overturning. If the shell and service equipment are so constructed as to withstand impact or overturning, it need not be protected in this way. Examples of such protection are provided in 6.7.4.12.5.

4.2.3.4 Unless the name of the gas(es) being transported appears on the metal plate described in 6.7.4.15.2, a copy of the certificate specified in 6.7.4.13.1 shall be made available upon a competent authority request and readily provided by the consignor, consignee or agent, as appropriate.

4.2.3.5 Empty portable tanks not cleaned and not gas-free shall comply with the same provisions as portable tanks filled with the previous substance.

4.2.3.6 **Filling**

4.2.3.6.1 Prior to filling, the shipper shall ensure that the portable tank is approved for the refrigerated liquefied gas to be transported and that the portable tank is not loaded with refrigerated liquefied gases which, in contact with the materials of the shell, gaskets and service equipment, are likely to react dangerously with them to form dangerous products or appreciably weaken these materials. During filling, the temperature of the refrigerated liquefied gas shall be within the limits of the design temperature range.

4.2.3.6.2 In estimating the initial degree of filling, the necessary holding time for the intended journey, including any delays which might be encountered, shall be taken into consideration. The initial degree of filling of the shell, except as provided for in 4.2.3.6.3 and 4.2.3.6.4, shall be such that if the contents, except helium, were to be raised to a temperature at which the vapour pressure is equal to the maximum allowable working pressure (MAWP) the volume occupied by liquid would not exceed 98%.

4.2.3.6.3 Shells intended for the transport of helium can be filled up to but not above the inlet of the pressure-relief device.

4.2.3.6.4 A higher initial degree of filling may be allowed, subject to approval by the competent authority, when the intended duration of transport is considerably shorter than the holding time.

4.2.3.6.5 Portable tanks shall not be filled or discharged while they remain on board.

4.2.3.7 Actual holding time

4.2.3.7.1 The actual holding time shall be calculated for each journey in accordance with a procedure recognized by the competent authority, on the basis of the following:

.1 the reference holding time for the refrigerated liquefied gas to be transported (see 6.7.4.2.8.1) (as indicated on the plate referred to in 6.7.4.15.1);

.2 the actual filling density;

.3 the actual filling pressure;

.4 the lowest set pressure of the pressure-limiting device(s).

4.2.3.7.2 The actual holding time shall be marked either on the portable tank itself or on a metal plate firmly secured to the portable tank, in accordance with 6.7.4.15.2.

4.2.3.8 Portable tanks shall not be offered for transport:

.1 in an ullage condition liable to produce an unacceptable hydraulic force due to surge within the shell;

.2 when leaking;

.3 when damaged to such an extent that the integrity of the portable tank or its lifting or securing arrangements may be affected;

.4 unless the service equipment has been examined and found to be in good working order;

.5 unless the actual holding time for the refrigerated liquefied gas being transported has been determined in accordance with 4.2.3.7 and the portable tank is marked in accordance with 6.7.4.15.2; and

.6 unless the duration of transport, after taking into consideration any delays which might be encountered, does not exceed the actual holding time.

4.2.3.9 Forklift pockets of portable tanks shall be closed off when the tank is filled. This provision does not apply to portable tanks which, according to 6.7.4.12.4, need not be provided with a means of closing off the forklift pockets.

4.2.4 General provisions for the use of multiple-element gas containers (MEGCs)

4.2.4.1 This section provides general requirements applicable to the use of multiple-element gas containers (MEGCs) for the transport of non-refrigerated gases.

4.2.4.2 MEGCs shall conform to the design, construction, inspection and testing requirements detailed in 6.7.5. The elements of MEGCs shall be periodically inspected according to the provisions set out in packing instruction P200 and in 6.2.1.6.

4.2.4.3 During transport, MEGCs shall be protected against damage to the elements and service equipment resulting from lateral and longitudinal impact and overturning. If the elements and service equipment are so constructed as to withstand impact or overturning, they need not be protected in this way. Examples of such protection are given in 6.7.5.10.4.

4.2.4.4 The periodic testing and inspection requirements for MEGCs are specified in 6.7.5.12. MEGCs or their elements shall not be charged or filled after they become due for periodic inspection but may be transported after the expiry of the time limit.

4.2.4.5 Filling

4.2.4.5.1 Prior to filling, the MEGC shall be inspected to ensure that it is authorized for the gas to be transported and that the applicable provisions of this Code have been met.

4.2.4.5.2 Elements of MEGCs shall be filled according to the working pressures, filling ratios and filling provisions specified in packing instruction P200 for the specific gas being filled into each element. In no case shall an MEGC or group of elements be filled as a unit in excess of the lowest working pressure of any given element.

4.2.4.5.3 MEGCs shall not be filled above their maximum permissible gross mass.

4.2.4.5.4 Isolation valves shall be closed after filling and remain closed during transport. Toxic gases of class 2.3 shall only be transported in MEGCs where each element is equipped with an isolation valve.

4.2.4.5.5 The opening(s) for filling shall be closed by caps or plugs. The leakproofness of the closures and equipment shall be verified by the shipper after filling.

4.2.4.5.6 MEGCs shall not be offered for filling:

.1 when damaged to such an extent that the integrity of the pressure receptacles or their structural or service equipment may be affected;

.2 unless the pressure receptacles and their structural and service equipment have been examined and found to be in good working order; and

.3 unless the required certification, retest, and filling markings are legible.

4.2.4.6 Filled MEGCs shall not be offered for transport;

.1 when leaking;

.2 when damaged to such an extent that the integrity of the pressure receptacles or their structural or service equipment may be affected;

.3 unless the pressure receptacles and their structural and service equipment have been examined and found to be in good working order; and

.4 unless the required certification, retest, and filling markings are legible.

4.2.4.7 Empty MEGCs that have not been cleaned and purged shall comply with the same requirements as MEGCs filled with the previous substance.

4.2.5 Portable tank instructions and special provisions

4.2.5.1 General

4.2.5.1.1 This section includes the portable tank instructions and special provisions applicable to dangerous goods authorized to be transported in portable tanks. Each portable tank instruction is identified by an alpha-numeric designation (T1 to T75). The Dangerous Goods List in chapter 3.2 indicates the portable tank instruction that shall be used for each substance permitted for transport in a portable tank. When no portable tank instruction appears in the Dangerous Goods List, transport of the substance in portable tanks is not permitted unless a competent authority approval is granted as set out in 6.7.1.3. Portable tank special provisions are assigned to specific dangerous goods in the Dangerous Goods List in chapter 3.2. Each portable tank special provision is identified by an alpha-numeric designation (such as TP1). A listing of the portable tank special provisions is provided in 4.2.5.3.

Note: The gases authorized for transport in MEGCs are indicated in the column “MEGC” in Tables 1 and 2 of packing instruction P200 in 4.1.4.1.

4.2.5.2 Portable tank instructions

4.2.5.2.1 Portable tank instructions apply to dangerous goods of classes 1 to 9. Portable tank instructions provide specific information relevant to portable tank provisions applicable to specific substances. These provisions shall be met in addition to the general provisions in this chapter and chapter 6.7.

4.2.5.2.2 For substances of class 1 and classes 3 to 9, the portable tank instructions indicate the applicable minimum test pressure, the minimum shell thickness (in reference steel), bottom opening provisions and pressure-relief provisions. In T23, self-reactive substances of class 4.1 and class 5.2 organic peroxides permitted to be transported in portable tanks are listed along with applicable control and emergency temperatures.

4.2.5.2.3 Non-refrigerated liquefied gases are assigned to portable tank instruction T50. T50 provides the maximum allowable working pressures, bottom opening provisions, pressure-relief provisions and degree of filling provisions for non-refrigerated liquefied gases permitted for transport in portable tanks.

4.2.5.2.4 Refrigerated liquefied gases are assigned to portable tank instruction T75.

4.2.5.2.5 *Determination of the appropriate portable tank instructions*

When a specific portable tank instruction is specified in the Dangerous Goods List, additional portable tanks which possess higher test pressures, greater shell thicknesses, more stringent bottom opening and pressure-relief device arrangements may be used. The following guidelines apply to determining the appropriate portable tanks which may be used for transport of particular substances:

Portable tank instruction specified	Portable tank instructions also permitted
T1	T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19, T20, T21, T22
T2	T4, T5, T7, T8, T9, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19, T20, T21, T22
T3	T4, T5, T6, T7, T8, T9, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19, T20, T21, T22
T4	T5, T7, T8, T9, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19, T20, T21, T22
T5	T10, T14, T19, T20, T22
T6	T7, T8, T9, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19, T20, T21, T22
T7	T8, T9, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19, T20, T21, T22
T8	T9, T10, T13, T14, T19, T20, T21, T22
T9	T10, T13, T14, T19, T20, T21, T22
T10	T14, T19, T20, T22
T11	T12, T13, T14, T15, T16, T17, T18, T19, T20, T21, T22
T12	T14, T16, T18, T19, T20, T22
T13	T14, T19, T20, T21, T22
T14	T19, T20, T22
T15	T16, T17, T18, T19, T20, T21, T22
T16	T18, T19, T20, T22
T17	T18 , T19, T20, T21, T22
T18	T19, T20, T22
T19	T20, T22
T20	T22
T21	T22
T22	None
T23	None
T50	None

4.2.5.2.6 *Portable tank instructions*

Portable tank instructions specify the provisions applicable to a portable tank when used for the transport of specific substances. Portable tank instructions T1 to T22 specify the applicable minimum test pressure, the minimum shell thickness (in mm of reference steel), and the pressure relief and bottom-opening provisions.

T1 – T22	PORTABLE TANK INSTRUCTIONS			T1 – T22
These portable tank instructions apply to liquid and solid substances of classes 3 to 9. The general provisions of 6.7.2 shall be met.				
Portable tank instruction	**Minimum test pressure (bar)**	**Minimum shell thickness (in mm – reference steel) (see 6.7.2.4)**	**Pressure relief provisions[a] (see 6.7.2.8)**	**Bottom opening provisions[b] (see 6.7.2.6)**
T1	1.5	See 6.7.2.4.2	Normal	See 6.7.2.6.2
T2	1.5	See 6.7.2.4.2	Normal	See 6.7.2.6.3
T3	2.65	See 6.7.2.4.2	Normal	See 6.7.2.6.2
T4	2.65	See 6.7.2.4.2	Normal	See 6.7.2.6.3
T5	2.65	See 6.7.2.4.2	See 6.7.2.8.3	Not allowed
T6	4	See 6.7.2.4.2	Normal	See 6.7.2.6.2
T7	4	See 6.7.2.4.2	Normal	See 6.7.2.6.3
T8	4	See 6.7.2.4.2	Normal	Not allowed
T9	4	6 mm	Normal	Not allowed
T10	4	6 mm	See 6.7.2.8.3	Not allowed
T11	6	See 6.7.2.4.2	Normal	See 6.7.2.6.3
T12	6	See 6.7.2.4.2	See 6.7.2.8.3	See 6.7.2.6.3
T13	6	6 mm	Normal	Not allowed
T14	6	6 mm	See 6.7.2.8.3	Not allowed
T15	10	See 6.7.2.4.2	Normal	See 6.7.2.6.3
T16	10	See 6.7.2.4.2	See 6.7.2.8.3	See 6.7.2.6.3
T17	10	6 mm	Normal	See 6.7.2.6.3
T18	10	6 mm	See 6.7.2.8.3	See 6.7.2.6.3
T19	10	6 mm	See 6.7.2.8.3	Not allowed
T20	10	8 mm	See 6.7.2.8.3	Not allowed
T21	10	10 mm	Normal	Not allowed
T22	10	10 mm	See 6.7.2.8.3	Not allowed

[a] When the word “Normal” is indicated, all the provisions of 6.7.2.8 apply except for 6.7.2.8.3.

[b] When this column indicates “not allowed”, bottom openings are not permitted when the substance to be transported is a liquid (see 6.7.2.6.1). When the substance to be transported is a solid at all temperatures encountered under normal conditions of transport, bottom openings conforming to the provisions of 6.7.2.6.2 are authorized.

T23	PORTABLE TANK INSTRUCTION							T23
This portable tank instruction applies to substances of class 4.1 and class 5.2, organic peroxides. The general provisions of 4.2.1 and the provisions of 6.7.2 shall be met. The provisions specific to self-reactive substances of class 4.1 and organic peroxides of class 5.2 in 4.2.1.13 shall also be met.								
UN No.	**Substance**	**Minimum test pressure (bar)**	**Minimum shell thickness (mm – reference steel)**	**Bottom opening requirements**	**Pressure relief requirements**	**Degree of filling**	**Control temperature**	**Emergency temperature**
3109	**ORGANIC PEROXIDE TYPE F, LIQUID** *tert*-Butyl hydroperoxide,* not more than 72% with water Cumyl hydroperoxide, not more than 90% in diluent type A Di-*tert*-butyl peroxide, not more than 32% in diluent type A Isopropyl cumyl hydroperoxide, not more than 72% in diluent type A *p*-Menthyl hydroperoxide, not more than 72% in diluent type A Pinanyl hydroperoxide, not more than 56% in diluent type A	4	See 6.7.2.4.2	See 6.7.2.6.3	See 6.7.2.8.2, 4.2.1.13.6, 4.2.1.13.7, 4.2.1.13.8	See 4.2.1.13.13		
3110	**ORGANIC PEROXIDE TYPE F, SOLID** Dicumyl peroxide†	4	See 6.7.2.4.2	See 6.7.2.6.3	See 6.7.2.8.2, 4.2.1.13.6, 4.2.1.13.7, 4.2.1.13.8	See 4.2.1.13.13		
3119	**ORGANIC PEROXIDE TYPE F, LIQUID, TEMPERATURE CONTROLLED**	4	See 6.7.2.4.2	See 6.7.2.6.3	See 6.7.2.8.2, 4.2.1.13.6, 4.2.1.13.7, 4.2.1.13.8	See 4.2.1.13.13	‡	‡
	tert-Amyl peroxyneodecanoate, not more than 47% in diluent type A						–10°C	–5°C
	tert-Butyl peroxyacetate, not more than 32% in diluent type B						+30°C	+35°C
	tert-Butyl peroxy-2-ethyl-hexanoate, not more than 32% in diluent type B						+15°C	+20°C
	tert-Butyl peroxypivalate, not more than 27% in diluent type B						+5°C	+10°C
	tert-Butyl peroxy-3,5,5-trimethylhexanoate, not more than 32% in diluent type B						+35°C	+40°C
	Di-(3,5,5-trimethylhexanoyl) peroxide, not more than 38% in diluent type A or type B						0°C	+5°C
	Peroxyacetic acid, distilled, stabilized§						+30°C	+35°C
3120	**ORGANIC PEROXIDE TYPE F, SOLID, TEMPERATURE CONTROLLED**	4	See 6.7.2.4.2	See 6.7.2.6.3	See 6.7.2.8.2, 4.2.1.13.6, 4.2.1.13.7, 4.2.1.13.8	See 4.2.1.13.13	‡	‡

* Provided that steps have been taken to achieve the safety equivalence of 65% *tert*-butyl hydroperoxide and 35% water.

† Maximum quantity per portable tank: 2000 kg.

‡ As approved by the competent authority.

§ Formulation derived from distillation of peroxyacetic acid originating from peroxyacetic acid in concentration of not more than 41% with water, total active oxygen (peroxyacetic acid + H_2O_2) $\leq$ 9.5%, which fulfils the criteria of 2.5.3.3.2.6.

T23	PORTABLE TANK INSTRUCTION *(continued)*							T23
UN No.	Substance	Minimum test pressure (bar)	Minimum shell thickness (mm – reference steel)	Bottom opening requirements	Pressure relief requirements	Degree of filling	Control temperature	Emergency temperature
3229	**SELF-REACTIVE LIQUID TYPE F**	4	See 6.7.2.4.2	See 6.7.2.6.3	See 6.7.2.8.2, 4.2.1.13.6, 4.2.1.13.7, 4.2.1.13.8	See 4.2.1.13.13		
3230	**SELF-REACTIVE SOLID TYPE F**	4	See 6.7.2.4.2	See 6.7.2.6.3	See 6.7.2.8.2, 4.2.1.13.6, 4.2.1.13.7, 4.2.1.13.8	See 4.2.1.13.13		
3239	**SELF-REACTIVE LIQUID TYPE F, TEMPERATURE CONTROLLED**	4	See 6.7.2.4.2	See 6.7.2.6.3	See 6.7.2.8.2, 4.2.1.13.6, 4.2.1.13.7, 4.2.1.13.8	See 4.2.1.13.13	*	*
3240	**SELF-REACTIVE SOLID TYPE F, TEMPERATURE CONTROLLED**	4	See 6.7.2.4.2	See 6.7.2.6.3	See 6.7.2.8.2, 4.2.1.13.6, 4.2.1.13.7, 4.2.1.13.8	See 4.2.1.13.13	*	*

* As approved by the competent authority.

T50	PORTABLE TANK INSTRUCTION				T50
This portable tank instruction applies to non-refrigerated liquefied gases and chemicals under pressure (UN Nos. 3500, 3501, 3502, 3503, 3504 and 3505). The general provisions of 4.2.2 and the provisions of 6.7.3 shall be met.					
UN No.	Non-refrigerated liquefied gases	Maximum allowable working pressure (bar) Small; Bare; Sunshield; Insulated respectively[a]	Openings below liquid level	Pressure relief provisions[b] (see 6.7.3.7)	Maximum filling density (kg/ℓ)
1005	Ammonia, anhydrous	29.0 25.7 22.0 19.7	Allowed	See 6.7.3.7.3	0.53
1009	Bromotrifluoromethane (Refrigerant gas R 13B1)	38.0 34.0 30.0 27.5	Allowed	Normal	1.13
1010	Butadienes, stabilized	7.5 7.0 7.0 7.0	Allowed	Normal	0.55
1010	Butadienes and hydrocarbon mixture, stabilized with more than 40% butadienes	See MAWP definition in 6.7.3.1	Allowed	Normal	See 4.2.2.7
1011	Butane	7.0 7.0 7.0 7.0	Allowed	Normal	0.51
1012	Butylene	8.0 7.0 7.0 7.0	Allowed	Normal	0.53

[a] "Small" means tanks having a shell with a diameter of 1.5 metres or less; "Bare" means tanks having a shell with a diameter of more than 1.5 metres without insulation or sun shield (see 6.7.3.2.12); "Sunshield" means tanks having a shell with a diameter of more than 1.5 metres with sun shield (see 6.7.3.2.12); "Insulated" means tanks having a shell with a diameter of more than 1.5 metres with insulation (see 6.7.3.2.12); (See definition of "Design reference temperature" in 6.7.3.1).

[b] The word "Normal" in the pressure relief column indicates that a frangible disc as specified in 6.7.3.7.3 is not required.

T50	PORTABLE TANK INSTRUCTION *(continued)*				T50
UN No.	Non-refrigerated liquefied gases	Maximum allowable working pressure (bar) Small; Bare; Sunshield; Insulated respectively[a]	Openings below liquid level	Pressure relief provisions[b] (see 6.7.3.7)	Maximum filling density (kg/ℓ)
1017	Chlorine	19.0 17.0 15.0 13.5	Not allowed	See 6.7.3.7.3	1.25
1018	Chlorodifluoromethane (Refrigerant gas R 22)	26.0 24.0 21.0 19.0	Allowed	Normal	1.03
1020	Chloropentafluoroethane (Refrigerant gas R 115)	23.0 20.0 18.0 16.0	Allowed	Normal	1.06
1021	1-Chloro-1,2,2,2-tetrafluoroethane (Refrigerant gas R 124)	10.3 9.8 7.9 7.0	Allowed	Normal	1.20
1027	Cyclopropane	18.0 16.0 14.5 13.0	Allowed	Normal	0.53
1028	Dichlorodifluoromethane (Refrigerant gas R 12)	16.0 15.0 13.0 11.5	Allowed	Normal	1.15
1029	Dichlorofluoromethane (Refrigerant gas R 21)	7.0 7.0 7.0 7.0	Allowed	Normal	1.23
1030	1,1-Difluoroethane (Refrigerant gas R 152a)	16.0 14.0 12.4 11.0	Allowed	Normal	0.79
1032	Dimethylamine, anhydrous	7.0 7.0 7.0 7.0	Allowed	Normal	0.59
1033	Dimethyl ether	15.5 13.8 12.0 10.6	Allowed	Normal	0.58
1036	Ethylamine	7.0 7.0 7.0 7.0	Allowed	Normal	0.61
1037	Ethyl chloride	7.0 7.0 7.0 7.0	Allowed	Normal	0.80
1040	Ethylene oxide with nitrogen up to a total pressure of 1 MPa (10 bar) at 50°C	– – – 10.0	Not allowed	See 6.7.3.7.3	0.78
1041	Ethylene oxide and carbon dioxide mixture with more than 9% but not more than 87% ethylene oxide	See MAWP definition in 6.7.3.1	Allowed	Normal	See 4.2.2.7

[a] "Small" means tanks having a shell with a diameter of 1.5 metres or less; "Bare" means tanks having a shell with a diameter of more than 1.5 metres without insulation or sun shield (see 6.7.3.2.12); "Sunshield" means tanks having a shell with a diameter of more than 1.5 metres with sun shield (see 6.7.3.2.12); "Insulated" means tanks having a shell with a diameter of more than 1.5 metres with insulation (see 6.7.3.2.12); (See definition of "Design reference temperature" in 6.7.3.1).

[b] The word "Normal" in the pressure relief column indicates that a frangible disc as specified in 6.7.3.7.3 is not required.

T50	PORTABLE TANK INSTRUCTION *(continued)*				T50
UN No.	Non-refrigerated liquefied gases	Maximum allowable working pressure (bar) Small; Bare; Sunshield; Insulated respectively[a]	Openings below liquid level	Pressure relief provisions[b] (see 6.7.3.7)	Maximum filling density (kg/ℓ)
1055	Isobutylene	8.1 7.0 7.0 7.0	Allowed	Normal	0.52
1060	Methylacetylene and propadiene mixture, stabilized	28.0 24.5 22.0 20.0	Allowed	Normal	0.43
1061	Methylamine, anhydrous	10.8 9.6 7.8 7.0	Allowed	Normal	0.58
1062	Methyl bromide with not more than 2% chloropicrin	7.0 7.0 7.0 7.0	Not allowed	See 6.7.3.7.3	1.51
1063	Methyl chloride (Refrigerant gas R40)	14.5 12.7 11.3 10.0	Allowed	Normal	0.81
1064	Methyl mercaptan	7.0 7.0 7.0 7.0	Not allowed	See 6.7.3.7.3	0.78
1067	Dinitrogen tetroxide	7.0 7.0 7.0 7.0	Not allowed	See 6.7.3.7.3	1.30
1075	Petroleum gas, liquefied	See MAWP definition in 6.7.3.1	Allowed	Normal	See 4.2.2.7
1077	Propylene	28.0 24.5 22.0 20.0	Allowed	Normal	0.43
1078	Refrigerant gas, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	Normal	See 4.2.2.7
1079	Sulphur dioxide	11.6 10.3 8.5 7.6	Not allowed	See 6.7.3.7.3	1.23
1082	Trifluorochloroethylene, stabilized (Refrigerant gas R 1113)	17.0 15.0 13.1 11.6	Not allowed	See 6.7.3.7.3	1.13
1083	Trimethylamine, anhydrous	7.0 7.0 7.0 7.0	Allowed	Normal	0.56
1085	Vinyl bromide, stabilized	7.0 7.0 7.0 7.0	Allowed	Normal	1.37
1086	Vinyl chloride, stabilized	10.6 9.3 8.0 7.0	Allowed	Normal	0.81

[a] "Small" means tanks having a shell with a diameter of 1.5 metres or less; "Bare" means tanks having a shell with a diameter of more than 1.5 metres without insulation or sun shield (see 6.7.3.2.12); "Sunshield" means tanks having a shell with a diameter of more than 1.5 metres with sun shield (see 6.7.3.2.12); "Insulated" means tanks having a shell with a diameter of more than 1.5 metres with insulation (see 6.7.3.2.12); (See definition of "Design reference temperature" in 6.7.3.1).

[b] The word "Normal" in the pressure relief column indicates that a frangible disc as specified in 6.7.3.7.3 is not required.

T50	PORTABLE TANK INSTRUCTION *(continued)*				T50
UN No.	Non-refrigerated liquefied gases	Maximum allowable working pressure (bar) Small; Bare; Sunshield; Insulated respectively[a]	Openings below liquid level	Pressure relief provisions[b] (see 6.7.3.7)	Maximum filling density (kg/ℓ)
1087	Vinyl methyl ether, stabilized	7.0 7.0 7.0 7.0	Allowed	Normal	0.67
1581	Chloropicrin and methyl bromide mixture with more than 2% chloropicrin	7.0 7.0 7.0 7.0	Not allowed	See 6.7.3.7.3	1.51
1582	Chloropicrin and methyl chloride mixture	19.2 16.9 15.1 13.1	Not allowed	See 6.7.3.7.3	0.81
1858	Hexafluoropropylene (Refrigerant gas R 1216)	19.2 16.9 15.1 13.1	Allowed	Normal	1.11
1912	Methyl chloride and methylene chloride mixture	15.2 13.0 11.6 10.1	Allowed	Normal	0.81
1958	1,2-Dichloro-1,1,2,2-tetrafluoroethane (Refrigerant gas R 114)	7.0 7.0 7.0 7.0	Allowed	Normal	1.30
1965	Hydrocarbon gas, mixture liquefied, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	Normal	See 4.2.2.7
1969	Isobutane	8.5 7.5 7.0 7.0	Allowed	Normal	0.49
1973	Chlorodifluoromethane and chloropentafluoroethane mixture with fixed boiling point, with approximately 49% chlorodifluoromethane (Refrigerant gas R 502)	28.3 25.3 22.8 20.3	Allowed	Normal	1.05
1974	Chlorodifluorobromomethane (Refrigerant gas R 12B1)	7.4 7.0 7.0 7.0	Allowed	Normal	1.61
1976	Octafluorocyclobutane (Refrigerant gas RC 318)	8.8 7.8 7.0 7.0	Allowed	Normal	1.34
1978	Propane	22.5 20.4 18.0 16.5	Allowed	Normal	0.42
1983	1-Chloro-2,2,2-trifluoroethane (Refrigerant gas R 133a)	7.0 7.0 7.0 7.0	Allowed	Normal	1.18
2035	1,1,1-Trifluoroethane (Refrigerant gas R 143a)	31.0 27.5 24.2 21.8	Allowed	Normal	0.76

[a] "Small" means tanks having a shell with a diameter of 1.5 metres or less; "Bare" means tanks having a shell with a diameter of more than 1.5 metres without insulation or sun shield (see 6.7.3.2.12); "Sunshield" means tanks having a shell with a diameter of more than 1.5 metres with sun shield (see 6.7.3.2.12); "Insulated" means tanks having a shell with a diameter of more than 1.5 metres with insulation (see 6.7.3.2.12); (See definition of "Design reference temperature" in 6.7.3.1).

[b] The word "Normal" in the pressure relief column indicates that a frangible disc as specified in 6.7.3.7.3 is not required.

T50	PORTABLE TANK INSTRUCTION *(continued)*				T50
UN No.	Non-refrigerated liquefied gases	Maximum allowable working pressure (bar) Small; Bare; Sunshield; Insulated respectively[a]	Openings below liquid level	Pressure relief provisions[b] (see 6.7.3.7)	Maximum filling density (kg/ℓ)
2424	Octafluoropropane (Refrigerant gas R 218)	23.1 20.8 18.6 16.6	Allowed	Normal	1.07
2517	1-Chloro-1,1-difluoroethane (Refrigerant gas R 142b)	8.9 7.8 7.0 7.0	Allowed	Normal	0.99
2602	Dichlorodifluoromethane and difluoroethane azeotropic mixture with approximately 74% dichlorodifluoromethane (Refrigerant gas R 500)	20.0 18.0 16.0 14.5	Allowed	Normal	1.01
3057	Trifluoroacetyl chloride	14.6 12.9 11.3 9.9	Not allowed	See 6.7.3.7.3	1.17
3070	Ethylene oxide and dichlorodifluoromethane mixture, with not more than 12.5% ethylene oxide	14.0 12.0 11.0 9.0	Allowed	See 6.7.3.7.3	1.09
3153	Perfluoro(methyl vinyl ether)	14.3 13.4 11.2 10.2	Allowed	Normal	1.14
3159	1,1,1,2-Tetrafluoroethane (Refrigerant gas R 134a)	17.7 15.7 13.8 12.1	Allowed	Normal	1.04
3161	Liquefied gas, flammable, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	Normal	See 4.2.2.7
3163	Liquefied gas, N.O.S.	See MAWP definition in 6.7.3.1	Allowed	Normal	See 4.2.2.7
3220	Pentafluoroethane (Refrigerant gas R 125)	34.4 30.8 27.5 24.5	Allowed	Normal	0.87
3252	Difluoromethane (Refrigerant gas R 32)	43.0 39.0 34.4 30.5	Allowed	Normal	0.78
3296	Heptafluoropropane (Refrigerant gas R 227)	16.0 14.0 12.5 11.0	Allowed	Normal	1.20
3297	Ethylene oxide and chlorotetrafluoroethane mixture, with not more than 8.8% ethylene oxide	8.1 7.0 7.0 7.0	Allowed	Normal	1.16
3298	Ethylene oxide and pentafluoroethane mixture, with not more than 7.9% ethylene oxide	25.9 23.4 20.9 18.6	Allowed	Normal	1.02
3299	Ethylene oxide and tetrafluoroethane mixture, with not more than 5.6% ethylene oxide	16.7 14.7 12.9 11.2	Allowed	Normal	1.03

[a] "Small" means tanks having a shell with a diameter of 1.5 metres or less; "Bare" means tanks having a shell with a diameter of more than 1.5 metres without insulation or sun shield (see 6.7.3.2.12); "Sunshield" means tanks having a shell with a diameter of more than 1.5 metres with sun shield (see 6.7.3.2.12); "Insulated" means tanks having a shell with a diameter of more than 1.5 metres with insulation (see 6.7.3.2.12); (See definition of "Design reference temperature" in 6.7.3.1).

[b] The word "Normal" in the pressure relief column indicates that a frangible disc as specified in 6.7.3.7.3 is not required.

T50	PORTABLE TANK INSTRUCTION *(continued)*				T50
UN No.	Non-refrigerated liquefied gases	Maximum allowable working pressure (bar) Small; Bare; Sunshield; Insulated respectively[a]	Openings below liquid level	Pressure relief provisions[b] (see 6.7.3.7)	Maximum filling density (kg/ℓ)
3318	Ammonia solution, relative density less than 0.880 at 15°C in water, with more than 50% ammonia	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	See 4.2.2.7
3337	Refrigerant gas R 404A	31.6 28.3 25.3 22.5	Allowed	Normal	0.82
3338	Refrigerant gas R 407A	31.3 28.1 25.1 22.4	Allowed	Normal	0.94
3339	Refrigerant gas R 407B	33.0 29.6 26.5 23.6	Allowed	Normal	0.93
3340	Refrigerant gas R 407C	29.9 26.8 23.9 21.3	Allowed	Normal	0.95
3500	Chemical under pressure, n.o.s.	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	TP4[c]
3501	Chemical under pressure, flammable, n.o.s.	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	TP4[c]
3502	Chemical under pressure, toxic, n.o.s.	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	TP4[c]
3503	Chemical under pressure, corrosive, n.o.s.	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	TP4[c]
3504	Chemical under pressure, flammable, toxic, n.o.s.	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	TP4[c]
3505	Chemical under pressure, flammable, corrosive, n.o.s.	See MAWP definition in 6.7.3.1	Allowed	See 6.7.3.7.3	TP4[c]

[a] "Small" means tanks having a shell with a diameter of 1.5 metres or less; "Bare" means tanks having a shell with a diameter of more than 1.5 metres without insulation or sun shield (see 6.7.3.2.12); "Sunshield" means tanks having a shell with a diameter of more than 1.5 metres with sun shield (see 6.7.3.2.12); "Insulated" means tanks having a shell with a diameter of more than 1.5 metres with insulation (see 6.7.3.2.12); (See definition of "Design reference temperature" in 6.7.3.1).

[b] The word "Normal" in the pressure relief column indicates that a frangible disc as specified in 6.7.3.7.3 is not required.

[c] For UN Nos. 3500, 3501, 3502, 3503, 3504 and 3505, the degree of filling shall be considered instead of the maximum filling ratio.

T75	PORTABLE TANK INSTRUCTION	T75
This portable tank instruction applies to refrigerated liquefied gases. The general provisions of 4.2.3 and 6.7.4 shall be met.		

4.2.5.3 Portable tank special provisions

Portable tank special provisions are assigned to certain substances to indicate provisions which are in addition to or in lieu of those provided by the portable tank instructions or the provisions in chapter 6.7. Portable tank special provisions are identified by an alpha-numeric designation beginning with the letters "TP" (tank provision) and are assigned to specific substances in column 14 of the Dangerous Goods List in chapter 3.2. The following is a list of the portable tank special provisions:

TP1 The degree of filling prescribed in 4.2.1.9.2 shall not be exceeded.

TP2 The degree of filling prescribed in 4.2.1.9.3 shall not be exceeded.

TP3 The maximum degree of filling (in %) for solids transported above their melting points and for elevated temperature liquids shall be determined in accordance with 4.2.1.9.5.

TP4 The degree of filling shall not exceed 90% or, alternatively, any other value approved by the competent authority (see 4.2.1.16.2).

TP5 The degree of filling prescribed in 4.2.3.6 shall be met.

TP6 To prevent the tank bursting in any event, including fire engulfment, it shall be provided with pressure-relief devices which are adequate in relation to the capacity of the tank and to the nature of the substance transported. The device shall also be compatible with the substance.

TP7 Air shall be eliminated from the vapour space by nitrogen or other means.

TP8 The test pressure for the portable tank may be reduced to 1.5 bar when the flashpoint of the substances transported is greater than 0°C.

TP9 A substance under this description shall only be transported in a portable tank under an approval granted by the competent authority.

TP10 A lead lining, not less than 5 mm thick, which shall be tested annually, or another suitable lining material approved by the competent authority is required.

TP11 [Reserved]

TP12 [Reserved]

TP13 Self-contained breathing apparatus shall be provided when this substance is transported, unless no self-contained breathing apparatus, as required by SOLAS regulation II-2/19 (II-2/54), is on board.

TP14 [Reserved]

TP15 [Reserved]

TP16 The tank shall be fitted with a special device to prevent under-pressure and excess pressure during normal transport conditions. This device shall be approved by the competent authority. Pressure-relief provisions are as indicated in 6.7.2.8.3 to prevent crystallization of the product in the pressure-relief valve.

TP17 Only inorganic non-combustible materials shall be used for thermal insulation of the tank.

TP18 Temperature shall be maintained between 18°C and 40°C. Portable tanks containing solidified methacrylic acid shall not be reheated during transport.

TP19 The calculated shell thickness shall be increased by 3 mm. Shell thickness shall be verified ultrasonically at intervals midway between periodic hydraulic tests.

TP20 This substance shall only be transported in insulated tanks under a nitrogen blanket.

TP21 The shell thickness shall be not less than 8 mm. Tanks shall be hydraulically tested and internally inspected at intervals not exceeding 2.5 years.

TP22 Lubricant for joints or other devices shall be oxygen-compatible.

TP23 Transport permitted under special conditions prescribed by the competent authorities.

TP24 The portable tank may be fitted with a device located, under maximum filling conditions, in the vapour space of the shell to prevent the build-up of excess pressure due to the slow decomposition of the substance transported. This device shall also prevent an unacceptable amount of leakage of liquid in the case of overturning or entry of foreign matter into the tank. This device shall be approved by the competent authority or its authorized body.

TP25 Sulphur trioxide 99.95% pure and above may be transported in tanks without an inhibitor provided that it is maintained at a temperature equal to or above 32.5°C.

TP26 When transported under heated conditions, the heating device shall be fitted outside the shell. For UN 3176, this provision only applies when the substance reacts dangerously with water.

TP27 A portable tank having a minimum test pressure of 4 bar may be used if it is shown that a test pressure of 4 bar or less is acceptable according to the test pressure definition in 6.7.2.1.

TP28 A portable tank having a minimum test pressure of 2.65 bar may be used if it is shown that a test pressure of 2.65 bar or less is acceptable according to the test pressure definition in 6.7.2.1.

TP29 A portable tank having a minimum test pressure of 1.5 bar may be used if it is shown that a test pressure of 1.5 bar or less is acceptable according to the test pressure definition in 6.7.2.1.

TP30 This substance shall be transported in insulated tanks.

TP31 This substance shall be transported in tanks in solid state.

TP32 For UN 0331, UN 0332 and UN 3375, portable tanks may be used subject to the following conditions:

(a) To avoid unnecessary confinement, each portable tank constructed of metal shall be fitted with a pressure relief device that may be of the re-closing spring-loaded type, a frangible disc or a fusible element. The set-to-discharge or burst pressure, as applicable, shall not be greater than 2.65 bar for portable tanks with minimum test pressures greater than 4 bar.

(b) Suitability for transport in tanks shall be demonstrated. One method to evaluate this suitability is test 8 (d) in Test Series 8 (see United Nations *Manual of Tests and Criteria*, Part 1, sub-section 18.7).

(c) Substances shall not be allowed to remain in the portable tank for any period that could result in caking. Appropriate measures shall be taken to avoid accumulation and packing of substances in the tank (e.g. cleaning, etc).

TP33 The portable tank instruction assigned for this substance applies for granular and powdered solids and for solids which are filled and discharged at temperatures above their melting point and which are cooled and transported as a solid mass. For solids which are transported above their melting point, see 4.2.1.19.

TP34 Portable tanks need not be subjected to the impact test in 6.7.4.14.1 if the portable tank is marked "NOT FOR RAIL TRANSPORT" on the plate specified in 6.7.4.15.1 and also in letters at least 10 cm high on both sides of the outer jacket.

TP35 Portable tank instruction T14 may continue to be applied until 31 December 2014.

TP36 Fusible elements in the vapour space may be used on portable tanks.

TP37 Portable tank instruction T14 may continue to be applied until 31 December 2016 except that until that date:

.1 For UN Nos. 1810, 2474 and 2668, T7 may be applied;

.2 For UN No. 2486, T8 may be applied; and

.3 For UN No. 1838, T10 may be applied.

TP38 The portable tank instruction T9 may continue to be applied until 31 December 2018.

TP39 The portable tank instruction T4 may continue to be applied until 31 December 2018

TP40 Portable tanks shall not be transported when connected with spray application equipment.

TP90 Tanks with bottom openings may be used on short international voyages.

TP91 Portable tanks with bottom openings may also be used on long international voyages.

4.2.6 Additional provisions for the use of road tank vehicles

4.2.6.1 The tank of a road tank vehicle shall be attached to the vehicle during normal operations of filling, discharge and transport. IMO type 4 tanks shall be attached to the chassis when transported on board ships. Road tank vehicles shall not be filled or discharged while they remain on board. A road tank vehicle shall be driven on board on its own wheels and be fitted with permanent tie-down attachments for securing on board the ship.

4.2.6.2 Road tank vehicles shall comply with the provisions of chapter 6.8. IMO type 4, 6 and 8 tanks may be used according to the provisions of chapter 6.8 for short international voyages only.

Chapter 4.3

Use of bulk containers

Note: Sheeted bulk containers (BK1) shall not be used for sea transport, except as indicated in 4.3.3.

4.3.1 General provisions

4.3.1.1 This section provides general requirements applicable to the use of containers for the transport of solid substances in bulk. Substances shall be transported in bulk containers conforming to the applicable bulk container instruction identified by the letters BK in column 13 of the dangerous goods list, with the following meaning:

BK1: the transport in sheeted bulk containers is permitted

BK2: the transport in closed bulk containers is permitted

BK3: the transport in flexible bulk containers is permitted

The bulk container used shall conform to the provisions of chapter 6.9

4.3.1.2 Except as provided in 4.3.1.3, bulk containers shall only be used when a substance is assigned a bulk container code in column 13 of the Dangerous Goods List.

4.3.1.3 When a substance is not assigned BK2 or BK3 in column 13 of the dangerous goods list, interim approval for transport may be issued by the competent authority of the country of origin. The approval shall be included in the documentation of the consignment and contain, as a minimum, the information normally provided in the bulk container instruction and the conditions under which the substance shall be transported. Appropriate measures should be initiated by the competent authority to have the assignment included in the Dangerous Goods List. When a substance is not permitted in a BK1 bulk container, an exemption may be issued in accordance with 7.9.1.

4.3.1.4 Substances which may become liquid at temperatures likely to be encountered during transport are not permitted in bulk containers.

4.3.1.5 Bulk containers shall be siftproof and shall be so closed that none of the contents can escape under normal conditions of transport, including the effect of vibration, or by changes of temperature, humidity or pressure.

4.3.1.6 Bulk solids shall be loaded into bulk containers and evenly distributed in a manner that minimizes movement that could result in damage to the container or leakage of the dangerous goods.

4.3.1.7 Where venting devices are fitted, they shall be kept clear and operable.

4.3.1.8 Bulk solids shall not react dangerously with the material of the bulk container, gaskets, equipment including lids and tarpaulins, or with protective coatings which are in contact with the contents, or significantly weaken them. Bulk containers shall be so constructed or adapted that the goods cannot penetrate between wooden floor coverings or come into contact with those parts of the bulk containers that may be affected by the dangerous goods or residues thereof.

4.3.1.9 Before being filled and offered for transport, each bulk container shall be inspected and cleaned to ensure that it does not contain any residue on the interior or exterior that could:

- cause a dangerous reaction with the substance intended for transport;
- detrimentally affect the structural integrity of the bulk container; or
- affect the dangerous goods retention capabilities of the bulk container.

4.3.1.10 During transport, no dangerous residues shall adhere to the outer surfaces of a bulk container.

4.3.1.11 If several closure systems are fitted in series, the system which is located nearest to the dangerous goods to be transported shall be closed first before filling.

4.3.1.12 Empty bulk containers that have contained dangerous goods shall be treated in the same manner as is prescribed in this Code for a filled bulk container, unless adequate measures have been taken to nullify any hazard.

4.3.1.13 If bulk containers are used for the carriage of bulk goods liable to cause a dust explosion, or evolve flammable vapours (e.g., for certain wastes), measures shall be taken to exclude sources of ignition and to prevent dangerous electrostatic discharge during transport, loading or unloading of the goods.

4.3.1.14 Substances, for example wastes, which may react dangerously with one another and substances of different classes and goods not subject to this Code, which are liable to react dangerously with one another, shall not be mixed together in the same bulk container. Dangerous reactions are:

.1 combustion and/or evolution of considerable heat;

.2 emission of flammable and/or toxic gases;

.3 formation of corrosive liquids; or

.4 formation of unstable substances.

4.3.1.15 Before a bulk container is filled, it shall be visually examined to ensure it is structurally serviceable, its interior walls, ceiling and floors are free from protrusions or damage and that any inner liners or substance retaining equipment are free from rips, tears or any damage that would compromise its cargo retention capabilities. "Structurally serviceable" means the bulk container does not have major defects in its structural components, such as top and bottom side rails, top and bottom end rails, door sill and header, floor cross members, corner posts, and corner fittings in a freight container. Major defects include:

.1 bends, cracks or breaks in the structural or supporting members that affect the integrity of the container;

.2 more than one splice or an improper splice (such as a lapped splice) in top or bottom end rails or door headers;

.3 more than two splices in any one top or bottom side rail;

.4 any splice in a door sill or corner post;

.5 door hinges and hardware that are seized, twisted, broken, missing, or otherwise inoperative;

.6 gaskets and seals that do not seal;

.7 any distortion of the overall configuration great enough to prevent proper alignment of handling equipment, mounting and securing chassis or vehicle, or insertion into ships' cargo spaces;

.8 any damage to lifting attachments or handling equipment interface features; or

.9 any damage to service or operational equipment.

4.3.1.16 Before a flexible bulk container is filled it shall be visually examined to ensure it is structurally serviceable, its textile slings, load-bearing structure straps, body fabric, lock device parts including metal and textile parts are free from protrusions or damage and that inner liners are free from rips, tears or any damage.

4.3.1.16.1 For flexible bulk containers, the period of use permitted for the transport of dangerous goods shall be two years from the date of manufacture of the flexible bulk container.

4.3.1.16.2 A venting device shall be fitted if a dangerous accumulation of gases may develop within the flexible bulk container. The vent shall be so designed that the penetration of foreign substances is prevented under normal conditions of transport.

4.3.2 Additional provisions applicable to bulk goods of classes 4.2, 4.3, 5.1, 6.2, 7 and 8

4.3.2.1 Bulk goods of class 4.2

Only closed bulk containers (BK2) may be used. The total mass carried in a bulk container shall be such that its spontaneous ignition temperature is greater than 55°C.

4.3.2.2 Bulk goods of class 4.3

Only closed bulk containers (BK2) may be used. These goods shall be transported in bulk containers which are waterproof.

4.3.2.3 Bulk goods of class 5.1

Bulk containers shall be so constructed or adapted that the goods cannot come into contact with wood or any other incompatible material.

4.3.2.4 Bulk goods of class 6.2

4.3.2.4.1 *Transport in bulk containers of animal material of class 6.2*

Animal material containing infectious substances (UN Nos. 2814, 2900 and 3373) is authorized for transport in bulk containers provided the following conditions are met:

.1 Closed bulk containers, and their openings, shall be leakproof by design or by the fitting of a suitable liner.

.2 The animal material shall be thoroughly treated with an appropriate disinfectant before loading prior to transport.

.3 Closed bulk containers shall not be re-used until they have been thoroughly cleaned and disinfected.

Note: Additional provisions may be required by appropriate national health authorities.

4.3.2.4.2 *Bulk wastes of class 6.2 (UN 3291)*

.1 only closed bulk containers (BK2) shall be permitted;

.2 closed bulk containers, and their openings, shall be leakproof by design. These bulk containers shall have non-porous interior surfaces and shall be free from cracks or other features that could damage packagings inside, impede disinfection or permit inadvertent release;

.3 wastes of UN 3291 shall be contained within the closed bulk container in UN type tested and approved sealed leakproof plastics bags tested for solids of packing group II and marked in accordance with 6.1.3.1. Such plastics bags shall be capable of passing the tests for tear and impact resistance according to ISO 7765-1:1988 “Plastics film and sheeting – Determination of impact resistance by the free-falling dart method – Part 1: Staircase methods” and ISO 6383-2:1983 “Plastics – Film and sheeting – Determination of tear resistance – Part 2: Elmendorf method”. Each bag shall have an impact resistance of at least 165 g and a tear resistance of at least 480 g in both parallel and perpendicular planes with respect to the length of the bag. The maximum net mass of each plastics bag shall be 30 kg;

.4 single articles exceeding 30 kg such as soiled mattresses may be transported without the need for a plastics bag when authorized by the competent authority;

.5 wastes of UN 3291 which contain liquids shall only be transported in plastics bags containing sufficient absorbent material to absorb the entire amount of liquid without it spilling in the bulk container;

.6 wastes of UN 3291 containing sharp objects shall only be transported in UN type tested and approved rigid packagings meeting the provisions of packing instructions P621, IBC620 or LP621.

.7 rigid packagings specified in packing instructions P621, IBC620 or LP621 may also be used. They shall be properly secured to prevent damage during normal conditions of transport. Wastes transported in rigid packagings and plastics bags together in the same closed bulk container shall be adequately segregated from each other, e.g., by suitable rigid barriers or dividers, mesh nets or otherwise securing the packagings, such that they prevent damage to the packagings during normal conditions of transport;

.8 wastes of UN 3291 in plastics bags shall not be compressed in a closed bulk container in such a way that bags may be rendered no longer leakproof;

.9 the closed bulk container shall be inspected for leakage or spillage after each journey. If any wastes of UN 3291 have leaked or been spilled in the closed bulk container, it shall not be re-used until after it has been thoroughly cleaned and, if necessary, disinfected or decontaminated with an appropriate agent. No other goods shall be transported together with UN 3291 other than medical or veterinary wastes. Any such other wastes transported in the same closed bulk container shall be inspected for possible contamination.

4.3.2.5 Bulk material of class 7

For the transport of unpackaged radioactive material, see 4.1.9.2.3.

4.3.2.6 Bulk goods of class 8

Only closed bulk containers (BK2) may be used. These goods shall be transported in bulk containers which are watertight.

4.3.3 Additional provisions for the use of sheeted bulk containers (BK1)

4.3.3.1 Sheeted bulk containers (BK1) shall not be used for sea transport, except for UN 3077 not meeting the criteria of 2.9.3 transported on short international voyages.

4.3.4 Additional provisions for the use of flexible bulk containers (BK3)

4.3.4.1 Flexible bulk containers are only allowed in the holds of general cargo ships. They are not allowed to be transported in cargo transport units.

PART 5

CONSIGNMENT PROCEDURES

Chapter 5.1

General provisions

5.1.1 Application and general provisions

5.1.1.1 This part sets forth the provisions for dangerous goods consignments relative to authorization of consignments and advance notifications, marking, labelling, documentation (by manual, electronic data processing (EDP) or electronic data interchange (EDI) techniques) and placarding.

5.1.1.2 Except as otherwise provided in this Code, no person may offer dangerous goods for transport unless those goods are properly marked, labelled, placarded, described and certified on a transport document, and otherwise in a condition for transport as required by this part.

5.1.1.3.1 A carrier shall not accept dangerous goods for transport unless:

(a) A copy of the dangerous goods transport document and other documents or information as required by the provisions of this Code are provided; or

(b) The information applicable to the dangerous goods is provided in electronic form.

5.1.1.3.2 The information applicable to the dangerous goods shall accompany the dangerous goods to final destination. This information may be on the dangerous goods transport document or may be on another document. This information shall be given to the consignee when the dangerous goods are delivered.

5.1.1.3.3 When the information applicable to the dangerous goods is given to the carrier in electronic form, the information shall be available to the carrier at all times during transport to final destination. The information shall be able to be produced without delay as a paper document.

5.1.1.4 The purpose of indicating the Proper Shipping Name (see 3.1.2.1 and 3.1.2.2) and the UN Number of a substance, material or article offered for transport and, in the case of a marine pollutant, of the addition of "marine pollutant" on documentation accompanying the consignment, and of marking the Proper Shipping Name in accordance with 5.2.1 on the package, including IBCs containing the goods, is to ensure that the substance, material or article can be readily identified during transport. This ready identification is particularly important in the case of an accident involving these goods, in order to determine what emergency procedures are necessary to deal properly with the situation and, in the case of marine pollutants, for the master to comply with the reporting requirements of Protocol I of MARPOL 73/78.

5.1.2 Use of overpacks and unit loads

5.1.2.1 An overpack and unit load shall be marked with the Proper Shipping Name and the UN Number and marked and labelled, as required for packages by chapter 5.2, for each item of dangerous goods contained in the overpack or unit load unless markings and labels representative of all dangerous goods in the overpack or unit load are visible. An overpack, in addition, shall be marked with the word "OVERPACK" unless markings and labels representative of all dangerous goods, as required by chapter 5.2, in the overpack are visible, except as required in 5.2.2.1.12.

5.1.2.2 The individual packages comprising a unit load or an overpack shall be marked and labelled in accordance with chapter 5.2. Each package of dangerous goods contained in the unit load or overpack shall comply with all applicable provisions of the Code. The "OVERPACK" marking on an overpack is an indication of compliance with this provision. The intended function of each package shall not be impaired by the unit load or overpack.

5.1.2.3 Each package bearing package orientation markings as prescribed in 5.2.1.7 of this Code and which is overpacked, placed in a unit load or used as an inner packaging in a large packaging shall be oriented in accordance with such markings.

5.1.3 Empty uncleaned packagings or units

5.1.3.1 Other than for class 7, a packaging, including an IBC, which previously contained dangerous goods shall be identified, marked, labelled and placarded as required for those dangerous goods unless steps such as cleaning, purging of vapours or refilling with a non-dangerous substance are taken to nullify any hazard.

5.1.3.2 Packagings, including IBCs, and tanks used for the transport of radioactive material shall not be used for the transport of other goods unless decontaminated below the level of 0.4 Bq/cm^2 for beta and gamma emitters and low-toxicity alpha emitters and 0.04 Bq/cm^2 for all other alpha emitters.

5.1.3.3 Empty cargo transport units still containing residues of dangerous goods, or loaded with empty uncleaned packages or empty uncleaned bulk containers, shall comply with the provisions applicable to the goods last contained in the unit, packagings or bulk container.

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. Subsidiary risk labels need not be applied if the hazard is already represented by a primary risk label.

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, 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:

.1 the shipment of Type B(M) packages not conforming with the provisions of 6.4.7.5 or designed to allow controlled intermittent venting;

.2 the shipment of Type B(M) packages containing radioactive material with an activity greater than 3000A_1 or 3000A_2, as appropriate, or 1000 TBq, whichever is the lower;

.3 the shipment of packages containing fissile materials if the sum of the criticality safety indexes of the packages in a single freight container or in a single conveyance exceeds 50. Excluded from this requirement shall be shipments by seagoing vessels, if the sum of the criticality safety indexes does not exceed 50 for any hold, compartment or defined deck area and the distance of 6 m between groups of packages or overpacks as required in table 7.1.4.5.3.4 is met; and

.4 radiation protection programmes for shipments by special use vessels according to 7.1.4.5.7

except that a competent authority may authorize transport 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 provisions of this Code may be transported under special arrangement (see 1.5.4).

5.1.5.1.4 *Notifications*

Notification to competent authorities is required as follows:

.1 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 the country of origin of the shipment and to the competent authority of each country through or into which the consignment is to be transported. 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.

.2 For each of the following types of shipments:

.1 Type C packages containing radioactive material with an activity greater than 3000A_1 *or* 3000A_2, as appropriate, or 1000 TBq, whichever is the lower;

.2 Type B(U) packages containing radioactive material with an activity greater than 3000A_1 *or 3000*A_2, as appropriate, or 1000 TBq, whichever is the lower;

.3 Type B(M) packages;

.4 shipment under special arrangement

the consignor shall notify the competent authority of the country of origin of the shipment and the competent authority of each country through or into which the consignment is to be transported. 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.

.3 The consignor is not required to send a separate notification if the required information has been included in the application for shipment approval.

.4 The consignment notification shall include:

.1 sufficient information to enable the identification of the package or packages, including all applicable certificate numbers and identification marks;

.2 information on the date of shipment, the expected date of arrival and proposed routeing;

.3 the names of the radioactive material or nuclides;

.4 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

.5 the maximum activity of the radioactive contents during transport, expressed in units of becquerels (Bq) with an appropriate SI prefix symbol (see 1.2.2.1). For fissile material, the mass of fissile material (or of each fissile nuclide for mixtures when appropriate) in units of grams (g), or multiples thereof, may be used in place of activity.

5.1.5.2 Certificates issued by competent authority

5.1.5.2.1 Certificates issued by the competent authority are required for the following:

.1 Designs for:

.1 special form radioactive material;

.2 low dispersible radioactive material;

.3 packages containing 0.1 kg or more of uranium hexafluoride;

.4 all packages containing fissile material unless excepted by 6.4.11.2;

.5 Type B(U) packages and Type B(M) packages;

.6 Type C packages;

.2 Special arrangements;

.3 Certain shipments (see 5.1.5.1.2).

The certificates shall confirm that the applicable provisions 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 provisions in 6.4.23.

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 relevant competent authority, documentary evidence of the compliance of the package design with all the applicable provisions.

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 freight container, or for unpackaged LSA-I or SCO-I, shall be the number derived in accordance with the following procedure:

.1 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, freight 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;

.2 For tanks, freight containers and unpackaged LSA-I and SCO-I, the value determined in 5.1.5.3.1.1 above shall be multiplied by the appropriate factor from table 5.1.5.3.1;

.3 The value obtained in 5.1.5.3.1.1 and 5.1.5.3.1.2 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, freight containers and unpackaged LSA-I and SCO-I

Size of load[a]	Multiplication factor
size of load $\leq$ 1 m^2	1
1 m^2 $<$ size of load $\leq$ 5 m^2	2
5 m^2 $<$ size of load $\leq$ 20 m^2	3
20 m^2 $<$ 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, freight container or conveyance 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 freight 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 conveyance.

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:

.1 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;

.2 The transport index shall be determined following the procedures specified in 5.1.5.3.1 and 5.1.5.3.2;

.3 If the surface radiation level is greater than 2 mSv/h, the package or overpack shall be transported under exclusive use and under the provisions of 7.1.4.5.6 or 7.1.4.5.7, as appropriate;

.4 A package transported under a special arrangement shall be assigned to category III – YELLOW except under the provisions of 5.1.5.3.5;

.5 An overpack which contains packages transported under special arrangement shall be assigned to category III – YELLOW except under the provisions of 5.1.5.3.5.

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 5.1.5.3.1.3.
[b] Shall also be transported under "exclusive use".

5.1.5.3.5 In all cases of international transport of packages requiring competent authority design or shipment approval, for which different approval types apply in the different countries concerned by the shipment, the categorization shall be in accordance with the certificate of the country of origin of design.

5.1.5.4 Specific provisions for excepted packages

5.1.5.4.1 Excepted packages shall be legibly and durably marked on the outside of the packaging with:

.1 The UN Number preceded by the letters "UN";

.2 An identification of either the consignor or consignee, or both; and

.3 The permissible gross mass if this exceeds 50 kg.

5.1.5.4.2 The documentation provisions of chapter 5.4 do not apply to excepted packages of radioactive material, except that the UN Number preceded by the letters “UN”, and the name and address of the consignor and the consignee shall be shown on a transport document such as a bill of lading, air waybill or other similar document.

5.1.6 Packages packed into a cargo transport unit

5.1.6.1 Regardless of the placarding and marking provisions for cargo transport units, each package containing dangerous goods packed into a cargo transport unit shall be marked and labelled in accordance with the requirements of chapter 5.2.

Chapter 5.2

Marking and labelling of packages including IBCs

Note: These provisions relate essentially to the marking and labelling of dangerous goods according to their properties. However, additional markings or symbols indicating precautions to be taken in handling or storing a package (such as a symbol representing an umbrella, indicating that a package shall be kept dry) may be displayed on a package if appropriate.

5.2.1 Marking of packages including IBCs

5.2.1.1 Unless provided otherwise in this Code, the Proper Shipping Name for the dangerous goods as determined in accordance with 3.1.2 and the corresponding UN Number, preceded by the letters "UN", shall be displayed on each package. The UN number and the letters "UN" shall be at least 12 mm high, except for packagings of 30 ℓ or 30 kg capacity or less and except for cylinders of 60 ℓ water capacity or less, when they shall be at least 6 mm in height and for packagings of 5 ℓ or 5 kg or less when they shall be of an appropriate size. 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. For goods of division 1.4, compatibility group S, the division and compatibility group letter shall also be marked unless the label for 1.4S is displayed. A typical package marking is:

CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (caprylyl chloride) UN 3265.

Note: Cylinders of 60 ℓ water capacity or less marked with a UN number in accordance with the provisions of the IMDG Code up to 31 December 2013 and which do not conform to the provisions of 5.2.1.1 regarding the size of the UN number and of the letters "UN" applicable as from 1 January 2014 may continue to be used until the next periodic inspection but no later than 1 July 2018.

5.2.1.2 All package markings required by 5.2.1.1:

.1 shall be readily visible and legible;

.2 shall be such that this information will still be identifiable on packages surviving at least three months' immersion in the sea. In considering suitable marking methods, account shall be taken of the durability of the packaging materials used and the surface of the package;

.3 shall be displayed on a background of contrasting colour on the external surface of the package; and

.4 shall not be located with other package markings that could substantially reduce their effectiveness.

5.2.1.3 Salvage packagings and salvage pressure receptacles shall additionally be marked with the word "SALVAGE".

5.2.1.4 Intermediate bulk containers of more than 450 ℓ capacity and large packagings shall be marked on two opposing sides.

5.2.1.5 Special marking provisions for class 7

5.2.1.5.1 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.

5.2.1.5.2 The marking of excepted packages shall be as required by 5.1.5.4.1.

5.2.1.5.3 Each package of gross mass exceeding 50 kg shall have its permissible gross mass legibly and durably marked on the outside of the packaging.

5.2.1.5.4 Each package which conforms to:

.1 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;

.2 a Type A package design shall be legibly and durably marked on the outside of the packaging with "TYPE A";

.3 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) 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.

5.2.1.5.5 Each package which conforms to a design approved by the competent authority under 6.4.22.1–6.4.22.5 or 6.4.24.2–6.4.24.3 shall be legibly and durably marked on the outside of the packaging with:

.1 the identification mark allocated to that design by the competent authority;

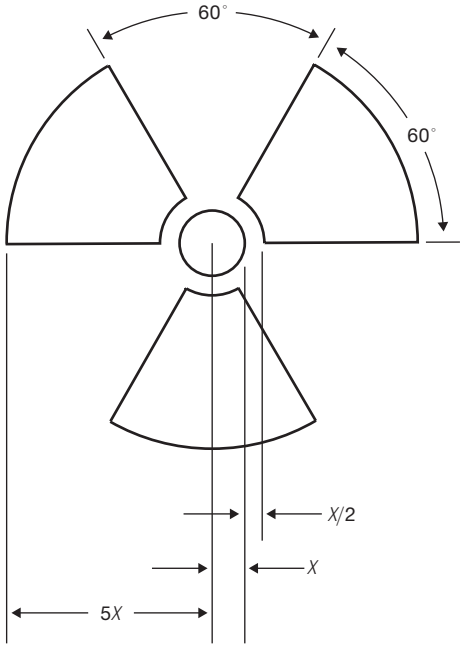
.2 a serial number to uniquely identify each packaging which conforms to that design;

.3 in the case of a Type B(U) or Type B(M) package design, with "TYPE B(U)" or "TYPE B(M)"; and

.4 in the case of a Type C package design, with "TYPE C".

5.2.1.5.6 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 below.

Basic trefoil symbol with proportions based on a central circle of radius *X*.
The minimum allowable size of *X* shall be 4 mm.



5.2.1.5.7 Where LSA-I or SCO-I material is contained in receptacles or wrapping materials and is transported under exclusive use as permitted by 4.1.9.2.3, the outer surface of these receptacles or wrapping materials may bear the marking "RADIOACTIVE LSA-I" or "RADIOACTIVE SCO-I", as appropriate.

5.2.1.5.8 In all cases of international transport of packages requiring competent authority design or shipment approval, for which different approval types apply in the different countries concerned by the shipment, marking shall be in accordance with the certificate of the country of origin of the design.

5.2.1.6 Special marking provisions for marine pollutants

5.2.1.6.1 Packages containing marine pollutants meeting the criteria of 2.9.3 shall be durably marked with the environmentally hazardous substance mark with the exception of single packagings and combination packagings where such single packings or inner packagings of such combination packagings have:

– a net quantity of 5 ℓ or less for liquids; or

– a net mass of 5 kg or less for solids.

5.2.1.6.2 The marine pollutant mark shall be located adjacent to the markings required by 5.2.1.1. The provisions of 5.2.1.2 and 5.2.1.4 shall be met.

5.2.1.6.3 The marine pollutant mark shall be as shown below. For packagings, the dimensions shall be at least 100 mm × 100 mm, except in the case of packages of such dimensions that they can only bear smaller marks.

Marine pollutant mark

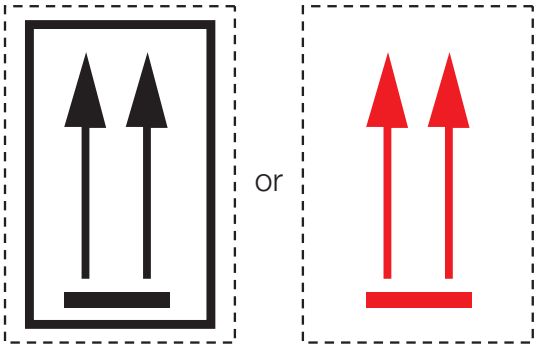
Symbol (fish and tree): black on white or suitable contrasting background

NOTE: The labelling provisions of 5.2.2 apply in addition to any requirement for packages to bear the environmentally hazardous substance mark

5.2.1.7 Except as provided in 5.2.1.7.1:

- combination packagings having inner packagings containing liquid dangerous goods;
- single packagings fitted with vents; and
- cryogenic receptacles intended for the transport 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 780:1997. 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

5.2.1.7.1 Orientation arrows are not required on:

(a) Outer packagings containing pressure receptacles except cryogenic receptacles;

(b) Outer packagings containing dangerous goods in inner packagings each containing not more than 120 ml, with sufficient absorbent material between the inner and outer packagings to completely absorb the liquid contents;

(c) Outer packagings containing Division 6.2 infectious substances in primary receptacles each containing not more than 50 ml;

(d) Type IP-2, type IP-3, type A, type B(U), type B(M) or type C packages containing Class 7 radioactive material;

(e) Outer packagings containing articles which are leak-tight in all orientations (e.g., alcohol or mercury in thermometers, aerosols, etc.); or

(f) Outer packagings containing dangerous goods in hermetically sealed inner packagings each containing not more than 500 mℓ.

5.2.1.7.2 Arrows for purposes other than indicating proper package orientation shall not be displayed on a package marked in accordance with this sub-section.

5.2.1.8 Excepted quantity mark

5.2.1.8.1 Packages containing excepted quantities of dangerous goods shall be marked according to 3.5.4.

5.2.1.9 Limited quantity mark

5.2.1.9.1 Packages containing dangerous goods packed in limited quantities shall be marked according to 3.4.5.

5.2.2 Labelling of packages including IBCs

5.2.2.1 Labelling provisions

These provisions are related essentially to danger labels. However, additional markings or symbols indicating precautions to be taken in handling or storing a package (such as a symbol representing an umbrella, indicating that a package shall be kept dry) may be displayed on a package if appropriate.

5.2.2.1.1 Labels identifying primary and subsidiary risks shall conform to models Nos. 1 to 9 illustrated in 5.2.2.2.2. The "EXPLOSIVE" subsidiary risk label is model No. 1.

5.2.2.1.2 Where articles or substances are specifically listed in the Dangerous Goods List, a danger class label shall be affixed for the hazard shown in column 3. A subsidiary risk label shall also be affixed for any risk indicated by a class or division number in column 4 of the Dangerous Goods List. However, special provisions indicated in column 6 may also require a subsidiary risk label where no subsidiary risk is indicated in column 4 or may exempt from the requirement for a subsidiary risk label where such a risk is indicated in the Dangerous Goods List.

5.2.2.1.2.1 A package containing a dangerous substance which has a low degree of danger may be exempt from these labelling requirements. In this case, a special provision specifying that no hazard label is required appears in column 6 of the Dangerous Goods List for the relevant substance. However, for certain substances the package shall be marked with the appropriate text as it appears in the special provision, e.g.:

Substance	UN No.	Class	Mark required on bales
Baled hay in cargo transport unit	UN 1327	4.1	None
Baled hay not in cargo transport unit	UN 1327	4.1	Class 4.1
Baled dry vegetable fibres in cargo transport unit	UN 3360	4.1	None

Substance	UN No.	Class	Mark required on packages in addition to the Proper Shipping Name and UN Number
Fishmeal*	UN 1374	4.2	Class 4.2†
Batteries, wet, non-spillable	UN 2800	8	Class 8‡

* Only applicable to fishmeal in packing group III.

† Exempt from class marking when loaded in a cargo transport unit containing only fishmeal under UN 1374.

‡ Exempt from class marking when loaded in a cargo transport unit containing only batteries under UN 2800.

5.2.2.1.3 Except as provided in 5.2.2.1.3.1, if a substance which meets the definition of more than one class is not specifically listed by name in the Dangerous Goods List in chapter 3.2, the provisions in chapter 2.0 shall be used to determine the primary risk class of the goods. In addition to the label required for that primary risk class, subsidiary risk labels shall also be applied as specified in the Dangerous Goods List.

5.2.2.1.3.1 Packagings containing substances of class 8 need not bear subsidiary risk label model No. 6.1 if the toxicity arises solely from the destructive effect on tissue. Substances of class 4.2 need not bear subsidiary risk label model No. 4.1.

5.2.2.1.4 *Labels for class 2 gases with subsidiary risk(s)*

Class	Subsidiary risk(s) shown in chapter 2.2	Primary risk label	Subsidiary risk label(s)
2.1	None	2.1	None
2.2	None	2.2	None
	5.1	2.2	5.1
2.3	None	2.3	None
	2.1	2.3	2.1
	5.1	2.3	5.1
	5.1, 8	2.3	5.1, 8
	8	2.3	8
	2.1, 8	2.3	2.1, 8

5.2.2.1.5 Three separate labels have been provided for class 2, one for flammable gases of class 2.1 (red), one for non-flammable, non-toxic gases of class 2.2 (green) and one for toxic gases of class 2.3 (white). Where the Dangerous Goods List indicates that a class 2 gas possesses single or multiple subsidiary risks, labels shall be used in accordance with the table in 5.2.2.1.4.

5.2.2.1.6 Except as provided in 5.2.2.2.1.2, each label shall:

.1 be located on the same surface of the package near the Proper Shipping Name marking, if the package dimensions are adequate;

.2 be so placed on the packaging that it is not covered or obscured by any part or attachment to the packaging or any other label or marking; and

.3 when primary and subsidiary risk labels are required, be displayed next to each other.

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 ℓ capacity and large packagings shall be labelled on two opposing sides.

5.2.2.1.8 Labels shall be affixed on a surface of contrasting colour.

5.2.2.1.9 *Special provisions for the labelling of self-reactive substances*

An “EXPLOSIVE” subsidiary risk label (No. 1) shall be applied for type B self-reactive substances, unless the competent authority has permitted this label to be dispensed with for a specific packaging because test data have proved that the self-reactive substance in such a packaging does not exhibit explosive behaviour.

5.2.2.1.10 *Special provisions for the labelling of organic peroxides*

The class 5.2 label (model No. 5.2) shall be affixed to packages containing organic peroxides classified as types B, C, D, E or F. This label also implies that the product may be flammable and hence no “FLAMMABLE LIQUID” subsidiary risk label (model No. 3) is required. In addition, the following subsidiary risk labels shall be applied:

.1 An “EXPLOSIVE” subsidiary risk label (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 proved that the organic peroxide in such a packaging does not exhibit explosive behaviour.

.2 A “CORROSIVE” subsidiary risk label (model No. 8) is required when packing group I or II criteria of class 8 are met.

5.2.2.1.11 *Special provisions for the labelling of infectious substances packages*

In addition to the primary risk label (model No. 6.2), infectious substances packages shall bear any other label required by the nature of the contents.

5.2.2.1.12 *Special provisions for the labelling of radioactive material*

5.2.2.1.12.1 Except when enlarged labels are used in accordance with 5.3.1.1.5.1, each package, overpack and freight 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 freight 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 freight 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 freight container containing fissile material, other than fissile material excepted under the provisions of 6.4.11.2, 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 this chapter. Any labels which do not relate to the contents shall be removed or covered.

5.2.2.1.12.2 Each label conforming to the models Nos. 7A, 7B and 7C shall be completed with the following information:

.1 *Contents:*

.1 Except for LSA-I material, the name(s) of the radionuclide(s) as taken from the table under 2.7.2.2.1, using the symbols prescribed therein. For mixtures of radionuclides, the most restrictive nuclides must 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.

.2 For LSA-I material, the term "LSA-I" is all that is necessary; the name of the radionuclide is not necessary.

.2 *Activity:* The maximum activity of the radioactive contents during transport, expressed in units of becquerels (Bq) with the appropriate SI prefix symbol (see 1.2.2.1). For fissile material, the mass of fissile material (or mass of each fissile nuclide for mixtures when appropriate) in units of grams (g), or multiples thereof, may be used in place of activity.

.3 For overpacks and freight containers, the "contents" and "activity" entries on the label shall bear the information required in 5.2.2.1.12.2.1 and 5.2.2.1.12.2.2, respectively, totalled together for the entire contents of the overpack or freight container except that, on labels for overpacks or freight containers containing mixed loads of packages containing different radionuclides, such entries may read "See transport documents".

.4 *Transport index:* 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.)

5.2.2.1.12.3 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.

5.2.2.1.12.4 For overpacks and freight containers, the criticality safety index (CSI) on the label shall bear the information required in 5.2.2.1.12.3 totalled together for the fissile contents of the overpack or freight container.

5.2.2.1.12.5 In all cases of international transport of packages requiring competent authority design or shipment approval, for which different approval types apply in the different countries concerned by the shipment, 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 of this section and conform, in terms of colour, symbols, numbers and general format, to the specimen labels shown in 5.2.2.2.2.

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, except in the case of packages of such dimensions that they can only bear smaller labels and as provided in 5.2.2.2.1.2. 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 Cylinders for class 2 may, on account of their shape, orientation and securing mechanisms for transport, bear labels representative of those specified in this section, which have been reduced in size, according to ISO 7225:2005, for display on the non-cylindrical part (shoulder) of such cylinders. Labels may overlap to the extent provided for by ISO 7225:2005 "Gas cylinders – Precautionary labels"; however, in all cases, the labels representing the primary hazard and the numbers appearing on any label shall remain fully visible and the symbols recognizable.

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 the class number 1, 2, 3, 4, 5.1, 5.2, 6, 7, 8 or 9 as appropriate. The label may include text such as the UN Number, or words describing the hazard class (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 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. For division 1.4, compatibility group S, no label is generally required. However, in cases where a label is considered necessary for such goods, it shall be based on model No. 1.4.

5.2.2.2.1.5 On labels other than those for material of class 7, the insertion of any text (other than the class or division 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 shown in black on all labels except for:

.1 the class 8 label, where the text (if any) and class number shall appear in white;

.2 labels with entirely green, red or blue backgrounds, where they may be shown in white;

.3 the class 5.2 label, where the symbol may be shown in white; and

.4 class 2.1 labels displayed on cylinders and gas cartridges for liquefied petroleum gases, where they may be shown in the background colour of the receptacle if adequate contrast is provided

5.2.2.2.1.7 The method of affixing the label(s) or applying stencil(s) of label(s) on packages containing dangerous goods shall be such that the label(s) or stencil(s) will still be identifiable on packages surviving at least three months' immersion in the sea. In considering suitable labelling methods, account shall be taken of the durability of the packaging materials used and the surface of the package.

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