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Contents

I *Acts whose publication is obligatory*

- ★ Amendments to Annexes A and B of Council Directive 94/55/EC as announced in Commission Directive 96/86/EC of 13 December 1996 adapting to technical progress Council Directive 94/55/EC on the approximation of the laws of the Member States with regard to the transport of dangerous goods by road ⁽¹⁾ . 1

⁽¹⁾ Text with EEA relevance.

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Acts whose titles are printed in light type are those relating to day-to-day management of agricultural matters, and are generally valid for a limited period.

The titles of all other Acts are printed in bold type and preceded by an asterisk.

I

(Acts whose publication is obligatory)

Amendments to Annexes A and B of Council Directive 94/55/EC⁽¹⁾ as announced in Commission Directive 96/86/EC of 13 December 1996 adapting to technical progress Council Directive 94/55/EC on the approximation of the laws of the Member States with regard to the transport of dangerous goods by road⁽²⁾

(Text with EEA relevance)

⁽¹⁾ OJ L 319, 12. 12. 1994, p. 7 and OJ L 275, 28. 10. 1996, p. 1.

⁽²⁾ OJ L 335, 24. 12. 1996, p. 43.

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(VOLUME I)

PROVISIONS CONCERNING DANGEROUS SUBSTANCES AND ARTICLES

PART I

DEFINITIONS AND GENERAL PROVISIONS

Definitions

- 2000 (1) Delete the definition of 'fragile package'.
- Add the following definitions:
- the term "Recommendations on the Transport of Dangerous Goods" means the ninth revised edition of the United Nations Recommendations on the Transport of Dangerous Goods (ST/SG/AC.10/1/Rev.9)
 - the term "Manual of Tests and Criteria" means the second revised edition of the United Nations Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria (ST/SG/AC.10/11/Rev.2).'
- (2) Amend 'batteries of receptacles' to read 'elements of battery-vehicles'.
- (6) Add a new paragraph (6) as follows:
- '(6) For the purposes of classification, dangerous goods with a melting point or initial melting point of 20° C or lower at a pressure of 101,3 kPa shall be considered to be liquids. A viscous substance for which a specific melting point cannot be determined shall be subjected to the ASTM D 4359-90 test or to the test for determining fluidity (penetrometer test) prescribed in Appendix A.3, marginal 3310.'
- 2001 (4) (b) Amend to read:
- '(b) in the case of mixtures of compressed gases: when filled by pressure, the proportion of the volume indicated as a percentage of the total volume of the gaseous mixture, or, when filled by mass, the proportion of the mass indicated as a percentage of the total mass of the mixture;
- in the case of mixtures of liquefied gases and gases dissolved under pressure: the proportion of the mass indicated as a percentage of the total mass of the mixture.'
- (7) Delete paragraph (7).
- Renumber the present (8) as (7).

General Provisions

- 2002 (1) Delete the text ', 2' in the first text in round brackets.
- Delete the text ', 2201' in the second text in round brackets.
- In the third text in round brackets amend the beginning to read:
- '(Classes 2, '.
- In the fourth text in round brackets amend the beginning to read:
- '(marginals 2201,'
- (2) Amend the entry for Class 2 to read:
- | | | |
|----------|-------|------------------|
| 'Class 2 | Gases | Non-restrictive' |
|----------|-------|------------------|

2002
(cont'd)

- (3) (a) Add the following sentence after the first sentence of the second paragraph:

'In case of multiple consignees, the name and address of the consignees and the quantities delivered enabling the nature and quantities transported to be evaluated at any time, may be entered in other documents which are to be used or in any other documents made mandatory according to other specific regulations and which shall be on board the vehicle.'

- (5) Amend to read:

- '(a) For the carriage of packagings containing dangerous goods, overpacks may be used if they meet the following conditions:

Overpack shall mean an enclosure used by a single consignor to contain one or more packages, consolidated into a single unit easier to handle and stow during carriage. Examples of overpacks:

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

Note: This definition does not apply to the overpacks defined in Class 7 (see marginal 2700, definition 13).

An overpack shall carry the identification number of the goods, preceded by the letters "UN", and the labels of all the packages contained in the overpack, unless the identification numbers and the labels representing all the dangerous goods contained in the overpack are visible.

Each package of dangerous goods contained in an overpack shall comply with all the provisions in force. The function of each packaging shall not be affected by the overpack.

The prohibitions on mixed loading in the various classes also apply to these overpacks.

- (b) Damaged, defective or leaking dangerous goods packages, or dangerous goods that have spilled or leaked may be carried in special salvage packagings described in marginal 3559. This does not prevent the use of a larger size packaging of appropriate type and performance level under the conditions of marginal 3500(14). When damaged packages are carried in salvage packagings, the salvage packagings shall bear the identification number preceded by the letters "UN" and all the danger labels of the damaged package it contains, as well as the word "SALVAGE". In addition to the particulars required in the various classes for the goods carried, the consignor shall enter the words "Salvage packaging" in the transport document.'

- (6) Replace the second sentence with the following text:

'Unless otherwise provided in this paragraph or the special conditions for the packing of certain substances, liquids of Classes 3, 4.1, 4.2, 4.3, 5.1, 6.1, 8 or 9 classified under (a) or (b) of the various items, in glass or earthenware packagings shall be packed using material capable of absorbing the liquid. Absorbent material shall not react dangerously with the liquid. Absorbent material is not required if the inner packagings are so protected that breakage of them and leakage of their contents from the outer packagings will not occur during normal conditions of carriage. Where absorbent material is required and an outer packaging is not leakproof, a means of containing the liquid in the event of a leakage shall be provided in the form of a leakproof liner, plastics bag or other equally effective means of containment [see also marginal 3500 (5)].'

- 2002 (8) (b) 2.1 Amend the beginning of the sixth subparagraph to read:
(cont'd) 'substances of Class 6.1 which are highly toxic on inhalation according to the criteria of marginal 2600 (3) (excluding...').
- 2.3.1 Replace '2600 (1), 2800 (1)' by '2600 (3), 2800 (3) and 2900 (2)'.
- 2.3.2 Amend the second example in the Note as follows:
'..., is to be classified under the entry 3290 *toxic solid, corrosive, inorganic, n.o.s.* in Class 6.1, 67° (b)'.

In footnote ⁽⁵⁾ to the table, for '(see Appendix A.3)' read '(see marginals 2400 and 2430)'.

(14) Insert in the marginal and in the note for:

'or 9, 1° to 8°, 13° and 14°' read 'or 9, 1° to 8°, 13°, 14°, 20°, 21° and 31° to 36°';

The section C becomes section G;

Renumber marginals 3390 to 3396 as marginals 3320 to 3326.

In footnote ⁽¹⁾ for '3396' read '3326'.

- 2003 (4) Amend in the sub-paragraph for Appendix A.2 the last part to read:

'...; and provisions relating to tests on aerosol dispensers and receptacles, small, containing gas (gas cartridges) of Class 2, 5°'

Amend the sub-paragraph for A.3 to read:

'Appendix A.3: Tests relating to flammable liquids of Classes 3, 6.1 and 8; tests for determining fluidity; tests for determining the ecotoxicity, persistence and bioaccumulation of substances in the aquatic environment for assignment to Class 9;'

- 2007 Amend to read as follows:

'Packages, including intermediate bulk containers (IBCs), containers and tank-containers, which do not entirely meet the packing, mixed packing, package marking and labelling requirements of this annex and marking and labelling requirements of Annex B but are in conformity with the requirements for maritime or air transport of dangerous goods⁽¹⁾ shall be accepted for carriage prior to or following maritime or air carriage subject to the following conditions:

- (a) If the packages are not marked and labelled in accordance with this Directive, they shall be marked and labelled in accordance with the provisions for maritime or air transport⁽¹⁾;
- (b) The provisions for maritime or air transport⁽¹⁾ shall be applicable to mixed packing within a package;
- (c) For carriage prior to or following maritime carriage only, if the containers or tank-containers are not marked and labelled in accordance with this Directive, they shall be marked and labelled (placarded) in accordance with the provisions for maritime transport⁽¹⁾;
- (d) In addition to the particulars prescribed for this Directive, the words "Carriage under marginal 2007 of this Directive" shall be entered in the transport document.

This derogation does not apply in the case of goods classified as dangerous goods in classes 1 to 8 according to this Directive and considered as non-dangerous according to the provisions for maritime or air transport⁽¹⁾.

Add the following footnote:

⁽¹⁾ These requirements are set out in the International Maritime Dangerous Goods (IMDG) Code published by the International Maritime Organization (IMO), London and in the Technical Instructions for the Safe Transport of Dangerous Goods by Air published by the International Civil Aviation Organization (ICAO), Montreal.'

2008 Add the following new marginal:

'If the carriage of dangerous goods in a large container precedes a voyage by sea, a container packing certificate conforming to paragraph 12.3.7 of the General Introduction to the IMDG Code⁽²⁾ shall be provided with the transport document.

The functions of the transport document required under marginal 2002(3)(a), of the declaration required under marginal 2002(9) and of the container packing certificate as provided above may be incorporated into a single document; if not, these documents shall be attached one to the other. If these functions are incorporated into a single document, the inclusion in the transport document of a statement that the loading of the container has been carried out in accordance with the applicable modal regulations together with the identification of the person responsible for the container packing certificate shall be sufficient. The use of electronic data processing (EDP) or electronic data interchange (EDI) techniques as an aid to or instead of paper documentation is not precluded.

Note: The container packing certificate is not required for tank-containers.'

Add the following footnote:

'⁽²⁾ Published by the International Maritime Organization (IMO) — Guidelines for use in practice and in training for loading goods in large containers have also been drawn up by IMO and the International Labour Organisation (ILO) and have been published by IMO — ("IMO/ILO Guidelines for Packing Cargo in Freight Containers or Vehicles").'

2009 Add a new marginal as follows:

'The provisions laid down in this Annex do not apply to:

- (a) The carriage of dangerous goods by private individuals where the goods in question are packaged for retail sale and are intended for their personal or domestic use or for their leisure or sporting activities;
- (b) The carriage of machinery or equipment not specified in this Annex and which happen to contain dangerous goods in their internal or operational equipment;
- (c) Carriage undertaken by enterprises which is ancillary to their main activity, such as deliveries to building or civil engineering sites, or in relation to surveying, repairs and maintenance, in quantities of not more than 450 litres per packaging and within the maximum quantities specified in marginal 10 011. However, carriage undertaken by such enterprises for their supply or external or internal distribution does not fall within the scope of this exemption;
- (d) Carriage undertaken by, or under the supervision of, the intervention services, in particular by breakdown vehicles carrying vehicles which have been involved in accidents or have broken down and contain dangerous goods;
- (e) Emergency transport intended to save human lives or protect the environment provided that all measures are taken to ensure that such transport is carried out in complete safety.'

2010 Add the following sentence after the second sentence of the existing text:

"Temporary derogations agreed before 1 January 1995 shall not be valid after 31 December 1998 unless renewed."

2011 Add a new marginal 2011 as follows:

'The substances and articles of this Directive may be carried until 30 June 1997 in accordance with the requirements of Annexes A and B of this Directive applicable until 31 December 1996. The transport document shall in such cases, bear the inscription "Carriage in accordance with ADR in force before 1 January 1997".'

PART II

LIST OF SUBSTANCES AND SPECIAL PROVISIONS FOR THE VARIOUS CLASSES

CLASS 1

EXPLOSIVE SUBSTANCES AND ARTICLES

Replace marginals 2100 to 2199 by the following:

1. List of substances and articles

2100 (1) Among the substances and articles covered by the title of Class 1, only those listed in marginal 2101 or assigned to an n.o.s. entry or to the entry '0190 samples, explosive' in marginal 2101 are to be accepted for carriage. These substances and articles are only to be accepted for carriage subject to the conditions set out in marginals 2100 (2) to 2116, Appendix A.1 and Annex B. They are then considered as substances and articles of this Directive.

(2) Class 1 comprises:

(a) Explosive substances: solid or liquid substances (or mixtures of substances) capable by chemical reaction of producing gases at such a temperature and pressure and at such a speed as to cause damage to the surroundings.

Pyrotechnic substances: substances or mixtures of substances designed to produce an effect by heat, light, sound, gas or smoke or a combination of these as the result of non-detonating self-sustaining exothermic chemical reactions.

Note: 1. Explosive substances which are unduly sensitive or are liable to spontaneous reaction are not to be accepted for carriage.

2. Substances which are not themselves explosive but which may form an explosive mixture of gas, vapour or dust are not substances of Class 1.

3. Also excluded from Class 1 are: water- or alcohol-wetted explosives the water or alcohol content of which exceeds the limits indicated in marginal 2101 and those containing plasticizers — these explosives are assigned to Class 4.1 (marginal 2401, 21°, 22° and 24°) — and those explosives which, on the basis of their predominant danger, are assigned to Class 5.2.

(b) Explosive articles: articles containing one or more explosive substances and/or pyrotechnic substances.

Note: Devices containing explosive and/or pyrotechnic substances in such small quantity or of such a character that their inadvertent or accidental ignition or initiation during carriage would not cause any manifestation external to the device by projection, fire, smoke, heat or loud noise are not subject to the requirements of Class 1.

(c) Substances and articles not mentioned under (a) or (b) above which are manufactured with a view to producing a practical effect by explosion or a pyrotechnic effect.

(3) Explosive substances and articles shall be assigned to a name in marginal 2101 in accordance with the test methods for the determination of explosive properties and the classification procedures set out in Appendix A.1 and they shall meet the conditions appropriate to that name or shall be assigned to an n.o.s. entry in marginal 2101 in accordance with these test methods and classification procedures.

Samples of new or existing explosive substances or articles carried for purposes including: testing, classification, research and development, quality control, or as a commercial sample, other than initiating explosive, may be assigned to the entry '0190 Samples, explosive', item 51° of marginal 2101.

- 2100** Assignment of substances and articles not mentioned by name to an n.o.s. entry or to the entry '0190 Samples, explosive' shall be made by the competent authority of the country of origin.
(*cont'd*)

Substances and articles which are assigned to an n.o.s. entry or to the entry '0190 Samples, explosive' as well as certain substances the carriage of which is subject to a specific authorization by the competent authority according to the notes inserted in the list of substances and articles of marginal 2101 may be carried only with the approval of the competent authority of the country of origin and under the conditions laid down by that authority.

The approval shall be issued in writing.

(4) Substances and articles of Class 1, other than empty packagings, uncleaned, of 91°, shall have been assigned to a division in accordance with paragraph (6) and to a compatibility group in accordance with paragraph (7). The division shall be based on the results of the tests described in Appendix A.1 applying the definitions in paragraph (6). The compatibility group shall be determined in accordance with the definitions in paragraph (7). The classification code shall consist of the division number and the compatibility group letter.

(5) Substances and articles of Class 1 are assigned to packing group II (see Appendix A.5).

(6) Definition of divisions

1.1 Substances and articles which have a mass explosion hazard. (A mass explosion is an explosion which affects almost the entire load virtually instantaneously).

1.2 Substances and articles which have a projection hazard but not a mass explosion hazard.

1.3 Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard:

(a) combustion of which gives rise to considerable radiant heat; or

(b) which burn one after another, producing minor blast or projection effects or both.

1.4 Substances and articles which present only a slight risk in the event of ignition or initiation during carriage. The effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package.

1.5 Very insensitive substances having a mass explosion hazard which are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of carriage. As a minimum requirement they shall not explode in the external fire test.

1.6 Extremely insensitive articles which do not have a mass explosion hazard. The articles contain only extremely insensitive detonating substances and demonstrate a negligible probability of accidental initiation or propagation.

Note: The risk from articles of Division 1.6 is limited to the explosion of a single article.

(7) Definition of compatibility groups of substances and articles:

A Primary explosive substance

B Article containing a primary explosive substance and not having two or more effective protective features. Some articles, such as detonators for blasting, detonator assemblies for blasting and primers, cap-type, are included, even though they do not contain primary explosives.

C Propellant explosive substance or other deflagrating explosive substance or article containing such explosive substance

D Secondary detonating explosive substance or black powder or article containing a secondary detonating explosive substance, in each case without means of initiation and without a propelling charge, or article containing a primary explosive substance and having two or more effective protective features

- 2100
(cont'd)
- E Article containing a secondary detonating explosive substance, without means of initiation, with a propelling charge (other than one containing a flammable liquid or gel or hypergolic liquids)
 - F Article containing a secondary detonating explosive substance with its own means of initiation, with a propelling charge (other than one containing a flammable liquid or gel or hypergolic liquids) or without a propelling charge
 - G Pyrotechnic substance, or article containing a pyrotechnic substance, or article containing both an explosive substance and an illuminating, incendiary, tear- or smoke-producing substance (other than a water-activated article or one which contains white phosphorus, phosphides, a pyrophoric substance, a flammable liquid or gel or hypergolic liquids)
 - H Article containing both an explosive substance and white phosphorus
 - J Article containing both an explosive substance and a flammable liquid or gel
 - K Article containing both an explosive substance and a toxic chemical agent
 - L Explosive substance or article containing an explosive substance and presenting a special risk (e.g. due to water activation or the presence of hypergolic liquids, phosphides or a pyrophoric substance) necessitating isolation of each type
 - N Articles containing only extremely insensitive detonating substances
 - S Substance or article so packed or designed that any hazardous effects arising from accidental functioning are confined within the package unless the package has been degraded by fire, in which case all blast or projection effects are limited to the extent that they do not significantly hinder or prevent fire-fighting or other emergency response efforts in the immediate vicinity of the package.

Note: 1. Each substance or article, packed in a specified packaging, may be assigned to one compatibility group only. Since the criterion of compatibility group S is empirical, assignment to this group is necessarily linked to the tests for assignment of a classification code.

2. Articles of compatibility groups D or E may be fitted or packed together with their own means of initiation provided that such means have at least two effective protective features designed to prevent an explosion in the event of accidental functioning of the means of initiation. Such packages shall be assigned to compatibility groups D or E.

3. Articles of compatibility groups D or E may be packed together with their own means of initiation, which do not have two effective protective features (i.e. means of initiation assigned to compatibility group B), provided that they comply with the requirements of marginal 2104 (6). Such packages shall be assigned to compatibility groups D or E.

4. Articles may be fitted or packed together with their own means of ignition provided that the means of ignition cannot function during normal conditions of carriage.

5. Articles of compatibility groups C, D and E may be packed together. Such packages shall be assigned to compatibility group E.

(8) Articles of compatibility group K, in accordance with paragraph (7), shall not be accepted for carriage.

(9) For the purposes of the requirements of this Class and by derogation from marginal 3510 (3), the term 'package' shall also include an unpackaged article in so far as that article is accepted for carriage unpackaged.

- 2101
- (1) The substances and articles of Class 1 to be accepted for carriage are listed in Table 1 below. Explosive substances and articles listed in marginal 3170 can be assigned to the various names in this marginal only if their properties, composition, construction and anticipated use correspond to one of the descriptions contained in Appendix A.1.

2101
(cont'd)

TABLE 1

List of substances and articles

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
01°	Substances classified as 1.1 A			
	0074 <i>Diazodinitrophenol, wetted</i> with not less than 40 % water, or mixture of alcohol and water, by mass <i>Note:</i> This substance, when containing less water or mixture of alcohol and water than specified, shall not be carried unless specifically authorized by the competent authority [see marginal 2100 (3)].	1.1 A	EP 10(a) or EP 10(b)	265 for EP 10(b)
	0113 <i>Guanyl nitrosaminoguanylidene hydrazine, wetted</i> with not less than 30 % water, by mass <i>Note:</i> This substance, when containing less water than specified, shall not be carried unless specifically authorized by the competent authority [see marginal 2100 (3)].	1.1 A	EP 10(a) or EP 10(b)	265 for EP 10(b)
	0114 <i>Guanyl nitrosaminoguanyltetrazene (Tetrazene), wetted</i> with not less than 30 % water, or mixture of alcohol and water, by mass <i>Note:</i> This substance, when containing less water or mixture of alcohol and water than specified, shall not be carried unless specifically authorized by the competent authority [see marginal 2100 (3)].	1.1 A	EP 10(a) or EP 10(b)	265 for EP 10(b)
	0129 <i>Lead azide, wetted</i> with not less than 20 % water, or mixture of alcohol and water, by mass <i>Note:</i> This substance, when containing less water or mixture of alcohol and water than specified, shall not be carried unless specifically authorized by the competent authority [see marginal 2100 (3)].	1.1 A	EP 10(a) or EP 10(b)	265 for EP 10(b)
	0130 <i>Lead styphnate (lead trinitroresorcinate) wetted</i>, with not less than 20 % water, or mixture of alcohol and water, by mass <i>Note:</i> This substance, when containing less water or mixture of alcohol and water than specified, shall not be carried unless specifically authorized by the competent authority [see marginal 2100 (3)].	1.1 A	EP 10(a) or EP 10(b)	265 for EP 10(b)

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.

2101
(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
01° (cont'd)	0135 <i>Mercury fulminate, wetted</i> with not less than 20 % water, or mixture of alcohol and water, by mass <i>Note:</i> This substance, when containing less water or mixture of alcohol and water than specified, shall not be carried unless specifically authorized by the competent authority [see marginal 2100 (3)].	1.1 A	EP 10(a) or EP 10(b)	265 for EP 10(b)
	0224 <i>Barium azide</i> , dry or wetted with less than 50 % water, by mass	1.1 A	EP 10(a) or EP 10(b)	265 for EP 10(b)
	0473 <i>Substances, explosive, n.o.s.</i> ⁽²⁾	1.1 A	E 01	
1°	Articles classified as 1.1 B			
	0029 <i>Detonators, non-electric</i> for blasting	1.1 B	EP 31	
	0030 <i>Detonators, electric</i> for blasting	1.1 B	EP 31	
	0073 <i>Detonators for ammunition</i>	1.1 B	EP 33	
	0106 <i>Fuses-detonating</i>	1.1 B	EP 41	
	0225 <i>Boosters with detonators</i>	1.1 B	EP 33	
	0360 <i>Detonator assemblies, non-electric</i> , for blasting	1.1 B	EP 31	
	0377 <i>Primers, cap-type</i>	1.1 B	EP 33	
	0461 <i>Components, explosive train, n.o.s.</i> ⁽²⁾	1.1 B	EP 01	
2°	Substances classified as 1.1 C			
	0160 <i>Powder, smokeless</i>	1.1 C	EP 14(b)	256
	0433 <i>Powder cake (powder paste), wetted</i> , with not less than 17 % alcohol by mass <i>Note:</i> This substance, when containing less alcohol than specified, shall not be carried unless specifically authorized by the competent authority [see marginal 2100 (3)].	1.1 C	EP 11	
	0474 <i>Substances, explosive, n.o.s.</i> ⁽²⁾	1.1 C	EP 01	
	0497 <i>Propellant, liquid</i> <i>Note:</i> Unless it can be demonstrated by testing that its sensitivity when frozen is no greater than when liquid, the propellant shall remain liquid during normal conditions of carriage and not freeze at temperatures above - 15 °C.	1.1 C	EP 15	254, 255
	0498 <i>Propellant, solid</i>	1.1 C	EP 14(b)	

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.⁽²⁾ Carriage only with the approval of the competent authority [see marginal 2100 (3)].

2101
(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
3°	Articles classified as 1.1 C			
	0271 <i>Charges, propelling</i>	1.1 C	EP 43	256
	0279 <i>Charges, propelling for cannon</i>	1.1 C	EP 30	
	0280 <i>Rocket motors</i>	1.1 C	EP 30	
	0326 <i>Cartridges for weapons, blank</i>	1.1 C	EP 30	
	0462 <i>Articles, explosive, n.o.s.</i> ⁽²⁾	1.1 C	EP 01	
4°	Substances classified as 1.1 D			
	0004 <i>Ammonium picrate, dry or wetted with less than 10 % water by mass</i>	1.1 D	EP 12	253
	0027 <i>Black powder (gunpowder) granular or as meal</i>	1.1 D	EP 13	
	0028 <i>Black powder (gunpowder), compressed, or black powder, gunpowder), in pellets</i>	1.1 D	EP 13	
	0072 <i>Cyclotrimethylenetrinitramine (cyclonite, hexogen, RDX) wetted with not less than 15 % water by mass</i> <i>Note: This substance, when containing less water than specified, shall not be carried unless specifically authorized by the competent auth- ority [see marginal 2100 (3)].</i>	1.1 D	EP 12(a)	
	0075 <i>Diethyleneglycol dinitrate, desensitized, with not less than 25 % non-volatile water-insoluble phlegmatizer by mass</i>	1.1 D	EP 15	254, 255
	0076 <i>Dinitrophenol, dry or wetted with less than 15 % water by mass</i>	1.1 D	EP 12	253
	0078 <i>Dinitroresorcinol, dry or wetted with less than 15 % water by mass</i>	1.1 D	EP 12	253
	0079 <i>Hexanitrodiphenylamine, (dipicrylamine, hexyl)</i>	1.1 D	EP 12(b) or EP 12(c)	
	0081 <i>Explosive, blasting, type A</i> <i>Note: Substances containing more than 40 % liquid nitric esters shall satisfy the exudation test specified in Appendix A.1, marginal 3101 (4).</i>	1.1 D	EP 16	
	0082 <i>Explosive, blasting, type B</i>	1.1 D	EP 16 or EP 17	260
	0083 <i>Explosive, blasting, type C</i>	1.1 D	EP 16	267
	0084 <i>Explosive, blasting, type D</i>	1.1 D	EP 16	
	0118 <i>Hexolite (hexotol), dry or wetted with less than 15 % water by mass</i>	1.1 D	EP 12	
	0133 <i>Mannitol hexanitrate (nitromannite), wetted with not less than 40 % water by mass, or a mixture of alcohol and water</i> <i>Note: This substance, when containing less alcohol or water than specified, shall not be carried unless specifically authorized by the competent authority [see marginal 2100 (3)].</i>	1.1 D	EP 12(a)	

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.

⁽²⁾ Carriage only with the approval of the competent authority [see marginal 2100 (3)].

2101
(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
4° (cont'd)	0143 <i>Nitroglycerin, desensitized</i> with not less than 40 % non-volatile water-soluble phlegmatizer by mass <i>Note:</i> 1. This substance, when containing less phlegmatizer than specified shall not be carried unless specifically authorized by the competent authority [see marginal 2100 (3)]. 2. 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. 3. The competent authority may authorize these mixtures to be classified in Class 4.1 on the basis of a Series 6 (c) test on at least three packages as prepared for carriage. 4. Mixtures containing at least 98 %, by mass, of phlegmatizer are not subject to the provisions of this Directive. 5. Packages containing mixtures with not less than 90 %, by mass, of phlegmatizer need not bear a label conforming to model No 6.1.	1.1 D	EP 15	254, 255
	0144 <i>Nitroglycerin solution in alcohol</i> with more than 1 % but not more than 10 % nitroglycerin <i>Note:</i> 3064 nitroglycerin, solution in alcohol with more than 1 % but not more than 5 % nitroglycerin, carried under special conditions of packing, is a substance of Class 3 (see marginal 2301, 6°).	1.1 D	EP 15	264
	0146 <i>Nitrostarch</i> , dry or wetted with less than 20 % water by mass	1.1 D	EP 12	
	0147 <i>Nitro-urea</i>	1.1 D	EP 12(b)	
	0150 <i>Pentaerythrite tetranitrate (pentaerythritol tetranitrate, PETN), wetted</i> with not less than 25 % water by mass, or <i>desensitized</i> with not less than 15 % phlegmatizer by mass <i>Note:</i> This substance, when containing less water or phlegmatizer than specified, shall not be carried unless specifically authorized by the competent authority [see or marginal 2100 (3)].	1.1 D	EP 12(a) or EP 12(b)	
	0151 <i>Pentolite</i> , dry or wetted with less than 15 % water by mass	1.1 D	EP 12	
	0153 <i>Trinitroaniline (picramide)</i>	1.1 D	EP 12(b) or EP 12(c)	

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.

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(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
4° (cont'd)	0154 <i>Trinitrophenol (picric acid)</i> , dry or wetted with less than 30 % water by mass <i>Note:</i> For small quantities of not more than 500 g per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provisions with respect to packaging (see marginal 2401, 21°).	1.1 D	EP 12	253
	0155 <i>Trinitrochlorobenzene (picryl chloride)</i> <i>Note:</i> For small quantities of not more than 500 g per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provisions with respect to packaging (see marginal 2401, 21°).	1.1 D	EP 12(b) or EP 12(c)	
	0207 <i>Tetranitroaniline</i>	1.1 D	EP 12(b) or EP 12 (c)	
	0208 <i>Trinitrophenylmethylnitramine (tetryl)</i>	1.1 D	EP 12(b) or EP 12(c)	
	0209 <i>Trinitrotoluene (tolite, TNT)</i> dry or wetted with less than 30 % water by mass <i>Note:</i> For small quantities of not more than 500 g per package, this substance, with not less than 10 % water, by mass, may also be classified DEP in Class 4.1, subject to special provisions with respect to packaging (see marginal 2401, 21°).	1.1 D	EP 12	262
	0213 <i>Trinitranisole</i>	1.1 D	EP 12(b) or EP 12(c)	
	0214 <i>Trinitrobenzene</i> , dry or wetted with less than 30 % water by mass <i>Note:</i> For small quantities of not more than 500 g per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provisions with respect to packaging (see marginal 2401, 21°).	1.1 D	EP 12	
	0215 <i>Trinitrobenzoic acid</i> , dry or wetted with less than 30 % water, by mass <i>Note:</i> For small quantities of not more than 500 g per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provisions with respect to packaging (see marginal 2401, 21°).	1.1 D	EP 12	
	0216 <i>Trinitro-m-cresol</i>	1.1 D	EP 12(b) or EP 12(c)	253
	0217 <i>Trinitronaphthalene</i>	1.1 D	EP 12(b) or EP 12(c)	

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.

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(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
4 ^o (cont'd)	0218 <i>Trinitrophenetole</i>	1.1 D	EP 12(b) or EP 12(c)	
	0219 <i>Trinitroresorcinol (styphnic acid)</i> , dry or wetted with less than 20 % water by mass (or mixture of alcohol and water)	1.1 D	EP 12	253
	0220 <i>Urea nitrate</i> , dry or wetted with less than 20 % water by mass <i>Note:</i> For quantities of not more than 11,5 kg per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provisions with respect to packaging (see marginal 2401, 21 ^o).	1.1 D	EP 12	
	0222 <i>Ammonium nitrate</i> containing more than 0,2 % combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	1.1 D	EP 12(b) or EP 12(c)	
	0223 <i>Ammonium nitrate fertilizer</i> , which is more liable to explode than ammonium nitrate with 0,2 % combustible substances, including any organic substance calculated as carbon, to the exclusion of any other substance	1.1 D	EP 12(b) or EP 12(c)	
	0226 <i>Cyclotetramethylenetetranitramine (HMX, octogen)</i> , wetted with not less than 15 % water by mass <i>Note:</i> This substance, when containing less water than specified, shall not be carried unless specifically authorized by the competent authority [see marginal 2100 (3)].	1.1 D	EP 12(a)	
	0241 <i>Explosive, blasting, type E</i>	1.1 D	EP 16 or EP 17	261 for EP 17
	0266 <i>Octolite (Octol)</i> , dry or wetted with less than 15 % water by mass	1.1 D	EP 12	
	0282 <i>Nitroguanidine (picrite)</i> , dry or wetted with less than 20 % water by mass	1.1 D	EP 12	
	0340 <i>Nitrocellulose</i> , dry or wetted with less than 25 % water (or alcohol) by mass	1.1 D	EP 12(a) or EP 12(b)	
	0341 <i>Nitrocellulose</i> , unmodified or plasticized with less than 18 % plasticizing substance by mass	1.1 D	EP 12(b)	
	0385 <i>5-Nitrobenzotriazol</i>	1.1 D	EP 12(b) or EP 12(c)	
	0386 <i>Trinitrobenzenesulphonic acid</i>	1.1 D	EP 12(b) or EP 12(c)	253
	0387 <i>Trinitrofluorenone</i>	1.1 D	EP 12(b) or EP 12(c)	
	0388 <i>Trinitrotoluene (TNT) and trinitrobenzene mixtures or trinitrotoluene (TNT) and hexanitrostilbene mixtures</i>	1.1 D	EP 12(b) or EP 12(c)	
	0389 <i>Trinitrotoluene (TNT) mixtures containing trinitrobenzene and hexanitrostilbene</i>	1.1 D	EP 12(b) or EP 12(c)	
	0390 <i>Tritonal</i>	1.1 D	EP 12(b) or EP 12(c)	

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.

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(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
4° (cont'd)	0391 <i>Cyclotrimethylenetrinitramine (cyclonite, hexogen RDX) and cyclotetramethylenetetranitramine (HMX, octogen) mixtures, wetted with not less than 15 % water by mass, or cyclotrimethylenetrinitramine (cyclonite, hexogen, RDX) and cyclotetramethylene-tetranitramine (HMX, octogen) mixtures desensitized with not less than 10 % phlegmatizer by mass</i> <i>Note:</i> This substance, when containing less water or phlegmatizer than specified, shall not be carried unless specifically authorized by the competent authority [see marginal 2100 (3)]. 0392 <i>Hexanitrostilbene</i> 0393 <i>Hexotonal</i> 0394 <i>Trinitroresorcinol (styphnic acid), wetted with not less than 20 % water by mass (or mixture of water and alcohol)</i> 0401 <i>Dipicryl sulphide</i> dry or wetted with less than 10 % water by mass <i>Note:</i> For small quantities of not more than 500 g per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provisions with respect to packaging (see marginal 2401, 21°). 0402 <i>Ammonium perchlorate</i> <i>Note:</i> Classification of this substance shall be in accordance with the results of the tests under Appendix A.1. Depending on the particle size and the packaging of the substance, see also Class 5.1 [marginal 2501, 12° (b)]. 0411 <i>Pentaerythrite tetranitrate (Pentaerythritol tetranitrate; PETN) with not less than 7 % wax, by mass</i> <i>Note:</i> The phlegmatized substance shall be significantly less sensitive than dry PETN. 0475 <i>Substances, explosive, n.o.s.</i> ⁽²⁾ 0483 <i>Cyclotrimethylenetrinitramine (cyclonite, hexogen, RDX) desensitized</i> 0484 <i>Cyclotetramethylenetetranitramine (octogen, HMX) desensitized</i> 0489 <i>Dinitroglycoluril (DINGU)</i> 0490 <i>Nitrotriazolone (NTO)</i> 0496 <i>Octonal</i>	1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D 1.1 D	EP 12(a) or EP 12(b) EP 12(b) or EP 12(c) EP 12(b) EP 12(a) EP 12 EP 12(b) or EP 12(c) EP 12(b) or EP 12(c) EP 01 EP 12(b) or EP 12(c) EP 12(b) or EP 12(c) EP 12(b) or EP 12(c) EP 12(b) or EP 12(c) EP 12(b) or EP 12(c) EP 12(b) or EP 12(c) EP 12(b) or EP 12(c)	253

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.⁽²⁾ Carriage only with the approval of the competent authority [see marginal 2100 (3)].

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(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
5°	Articles classified as 1.1 D			
	0034 <i>Bombs</i> with bursting charge	1.1 D	EP 30	
	0038 <i>Bombs, photoflash</i>	1.1 D	EP 30	
	0042 <i>Boosters</i> , without detonator	1.1 D	EP 32	
	0043 <i>Bursters</i> , explosive	1.1 D	EP 33	
	0048 <i>Charges</i> , demolition	1.1 D	EP 30	
	0056 <i>Charges</i> , depth	1.1 D	EP 30	
	0059 <i>Charges, shaped, commercial</i> , without detonator	1.1 D	EP 37	257
	0060 <i>Charges, supplementary, explosive</i>	1.1 D	EP 32	
	0065 <i>Cord, detonating</i> flexible	1.1 D	EP 39	258
	0099 <i>Fracturing devices, explosive</i> , without detonator, for oil wells	1.1 D	EP 34	
	0124 <i>Jet perforating guns, charged</i> , oil well, without detonator	1.1 D	EP 01	
	0137 <i>Mines</i> with bursting charge	1.1 D	EP 30	
	0168 <i>Projectiles</i> with bursting charge	1.1 D	EP 30	
	0221 <i>Warheads, torpedo</i> , with bursting charge	1.1 D	EP 30	
	0284 <i>Grenades</i> , hand or rifle, with bursting charge	1.1 D	EP 41	
	0286 <i>Warheads, rocket</i> , with bursting charge	1.1 D	EP 30	
	0288 <i>Charges, shaped, flexible, linear</i>	1.1 D	EP 38	
	0290 <i>Cord (fuse), detonating</i> , metal clad	1.1 D	EP 39	258
	0374 <i>Sounding devices, explosive</i>	1.1 D	EP 34	
	0408 <i>Fuzes, detonating</i> , with protective features	1.1 D	EP 41	
	0442 <i>Charges, explosive, commercial</i> without detonator	1.1 D	EP 37	
	0451 <i>Torpedoes</i> with bursting charge	1.1 D	EP 30	
	0457 <i>Charges, bursting, plastics bonded</i>	1.1 D	EP 30	
	0463 <i>Articles, explosive, n.o.s.</i> ⁽²⁾	1.1 D	EP 01	
6°	Articles classified as 1.1 E			
	0006 <i>Cartridges for weapons</i> , with bursting charge	1.1 E	EP 30	
	0181 <i>Rockets</i> with bursting charge	1.1 E	EP 30	
	0329 <i>Torpedoes</i> with bursting charge	1.1 E	EP 30	
	0464 <i>Articles, explosive, n.o.s.</i> ⁽²⁾	1.1 E	EP 01	
7°	Articles classified as 1.1 F			
	0005 <i>Cartridges for weapons</i> with bursting charge	1.1 F	EP 30	
	0033 <i>Bombs</i> with bursting charge	1.1 F	EP 30	
	0037 <i>Bombs, photoflash</i>	1.1 F	EP 30	
	0136 <i>Mines</i> with bursting charge	1.1 F	EP 30	

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(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
7° (cont'd)	0167 Projectiles with bursting charge	1.1 F	EP 30	263
	0180 Rockets with bursting charge	1.1 F	EP 30	
	0292 Grenades, hand or rifle, with bursting charge	1.1 F	EP 41	
	0296 Sounding devices, explosives	1.1 F	EP 34	
	0330 Torpedoes with bursting charge	1.1 F	EP 30	
	0369 Warheads, rocket, with bursting charge	1.1 F	EP 30	
	0465 Articles, explosive, n.o.s. ⁽²⁾	1.1 F	EP 01	
8°	Substances classified as 1.1 G			
	0094 Flash powder	1.1 G	EP 13	
	0476 Substances, explosive, n.o.s. ⁽²⁾	1.1 G	EP 01	
9°	Articles classified as 1.1 G			
	0049 Cartridges, flash	1.1 G	EP 35	
	0121 Igniters	1.1 G	EP 42	
	0192 Signals, railway track, explosive	1.1 G	EP 35	
	0194 Signals, distress, ship	1.1 G	EP 35	
	0196 Signals, smoke	1.1 G	EP 35	
	0333 Fireworks	1.1 G	EP 35	
	0418 Flares, surface	1.1 G	EP 35	
	0420 Flares, aerial	1.1 G	EP 35	
	0428 Articles, pyrotechnic for technical purposes	1.1 G	EP 35	
10°	Articles classified as 1.1 J			
	0397 Rockets, liquid fuelled, with bursting charge	1.1 J	EP 01	
	0399 Bombs with flammable liquid, with bursting charge	1.1 J	EP 01	
	0449 Torpedoes, liquid fuelled, with or without bursting charge	1.1 J	EP 01	
11°	Substances classified as 1.1 L			
	0357 Substances, explosive, n.o.s. ⁽²⁾	1.1 L	EP 01	
12°	Articles classified as 1.1 L			
	0354 Articles, explosives, n.o.s. ⁽²⁾	1.1 L	EP 01	
13°	Articles classified as 1.2 B			
	0107 Fuzes, detonating	1.2 B	EP 41	
	0268 Boosters, with detonator	1.2 B	EP 33	
	0364 Detonators, for ammunition	1.2 B	EP 33	
	0382 Components, explosive train, n.o.s. ⁽²⁾	1.2 B	EP 01	
14°	Substances classified as 1.2 C			
	(reserved)	1.2 C		

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(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
15°	Articles classified as 1.2 C			
	0281 <i>Rocket motors</i>	1.2 C	EP 30	
	0328 <i>Cartridges for weapons, inert projectile</i>	1.2 C	EP 30	
	0381 <i>Cartridges, power device</i>	1.2 C	EP 34	
	0413 <i>Cartridges for weapons, blank</i>	1.2 C	EP 30	
	0414 <i>Charges, propelling, for cannon</i>	1.2 C	EP 30	
	0415 <i>Charges, propelling</i>	1.2 C	EP 43	256
	0436 <i>Rockets with expelling charge</i>	1.2 C	EP 30	
	0466 <i>Articles, explosive, n.o.s.</i> ⁽²⁾	1.2 C	EP 01	
16°	Substances classified as 1.2 D (reserved)	1.2 D		
17°	Articles classified as 1.2 D			
	0035 <i>Bombs with bursting charge</i>	1.2 D	EP 30	
	0102 <i>Cord, (fuse), detonating, metal clad</i>	1.2 D	EP 39	258
	0138 <i>Mines with bursting charge</i>	1.2 D	EP 30	
	0169 <i>Projectiles with bursting charge</i>	1.2 D	EP 30	
	0283 <i>Boosters without detonator</i>	1.2 D	EP 32	
	0285 <i>Grenades, hand or rifle, with bursting charge</i>	1.2 D	EP 41	
	0287 <i>Warheads, rocket, with bursting charge</i>	1.2 D	EP 30	
	0346 <i>Projectiles with burster or expelling charge</i>	1.2 D	EP 30	
	0375 <i>Sounding devices, explosive</i>	1.2 D	EP 34	
	0409 <i>Fuzes, detonating with protective features</i>	1.2 D	EP 41	
	0439 <i>Charges, shaped, commercial without detonator</i>	1.2 D	EP 37	257
	0443 <i>Charges, explosive, commercial without detonator</i>	1.2 D	EP 37	
	0458 <i>Charges, bursting, plastics, bonded</i>	1.2 D	EP 30	
	0467 <i>Articles, explosive, n.o.s.</i> ⁽²⁾	1.2 D	EP 01	
18°	Articles classified as 1.2 E			
	0182 <i>Rockets with bursting charge</i>	1.2 E	EP 30	
	0321 <i>Cartridges for weapons with bursting charge</i>	1.2 E	EP 30	
	0468 <i>Articles, explosive, n.o.s.</i> ⁽²⁾	1.2 E	EP 01	
19°	Articles classified as 1.2 F			
	0007 <i>Cartridges for weapons, with bursting charge</i>	1.2 F	EP 30	
	0204 <i>Sounding devices, explosive</i>	1.2 F	EP 34	
	0291 <i>Bombs with bursting charge</i>	1.2 F	EP 30	
	0293 <i>Grenades, hand or rifle, with bursting charge</i>	1.2 F	EP 41	

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(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
19° (cont'd)	0294 Mines with bursting charge	1.2 F	EP 30	
	0295 Rockets with bursting charge	1.2 F	EP 30	
	0324 Projectiles with bursting charge	1.2 F	EP 30	
	0426 Projectiles with burster or expelling charge	1.2 F	EP 30	
	0469 Articles, explosive, n.o.s. ⁽²⁾	1.2 F	EP 01	
20°	Substances classified as 1.2 G (reserved)	1.2 G		
21°	Articles classified as 1.2 G			
	0009 Ammunition, incendiary with or without burster, expelling charge or propelling charge	1.2 G	EP 30	
	0015 Ammunition, smoke with or without burster, expelling charge or propelling charge	1.2 G	EP 30	
	0018 Ammunition, tear-producing with burster, expelling charge or propelling charge	1.2 G	EP 30	
	0039 Bombs, photoflash	1.2 G	EP 30	
	0171 Ammunition, illuminating with or without burster, expelling charge or propelling charge	1.2 G	EP 30	
	0238 Rockets, line-throwing	1.2 G	EP 30	
	0313 Signals, smoke	1.2 G	EP 35	
	0314 Igniters	1.2 G	EP 42	
	0334 Fireworks	1.2 G	EP 35	
	0372 Grenades, practice, hand or rifle	1.2 G	EP 41	
	0419 Flares, surface	1.2 G	EP 35	
	0421 Flares, aerial	1.2 G	EP 35	
	0429 Articles, pyrotechnic for technical purposes	1.2 G	EP 35	
	0434 Projectiles with burster or expelling charge	1.2 G	EP 30	
22°	Articles classified as 1.2 H			
	0243 Ammunition, incendiary, white phosphorus, with burster, expelling charge or propelling charge	1.2 H	EP 30	
	0245 Ammunition, smoke, white phosphorus, with burster, expelling charge or propelling charge	1.2 H	EP 30	
23°	Articles classified as 1.2 J			
	0395 Rocket motors, liquid fuelled	1.2 J	EP 01	
	0398 Rockets, liquid fuelled with bursting charge	1.2 J	EP 01	
	0400 Bombs with flammable liquid, with bursting charge	1.2 J	EP 01	
24°	Substances classified as 1.2 L			
	0358 Substances, explosive, n.o.s. ⁽²⁾	1.2 L	EP 01	

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(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
25°	Articles classified as 1.2 L			
	0248 <i>Contrivances, water-activated</i> with burster, expelling charge or propelling charge	1.2 L	EP 44	259
	0322 <i>Rocket motors with hypergolic liquids</i> with or without expelling charge	1.2 L	EP 01	
	0355 <i>Articles, explosive, n.o.s.</i> ⁽²⁾	1.2 L	EP 01	
	0380 <i>Articles, pyrophoric</i>	1.2 L	EP 01	
26°	Substances classified as 1.3 C			
	0077 <i>Dinitrophenolates</i> of all alkali metals, dry or wetted with less than 15 % water by mass	1.3 C	EP 14	253
	0132 <i>Deflagrating metal salts of aromatic nitro-derivatives, n.o.s.</i> ⁽²⁾	1.3 C	EP 14 (b)	253
	0159 <i>Powder-cake (powder paste), wetted</i> with not less than 25 % water by mass <i>Note:</i> This substance, when containing less water than specified, shall not be carried unless specifically authorized by the competent authority [see marginal 2100 (3)].	1.3 C	EP 11	
	0161 <i>Powder, smokeless</i>	1.3 C	EP 14 (b)	256
	0234 <i>Sodium dinitro-o-cresolate</i> , dry or wetted with less than 15 % water by mass <i>Note:</i> For small quantities of not more than 500 g per package, this substance, with not less than 10 % water, by mass, may also be classified in Class 4.1, subject to special provisions with respect to packaging (see marginal 2401, 22°)	1.3 C	EP 14	253
	0235 <i>Sodium picramate</i> , dry or wetted with less than 20 % water by mass	1.3 C	EP 14	253
	0236 <i>Zirconium picramate</i> , dry or wetted with less than 20 % water by mass	1.3 C	EP 14	253
	0342 <i>Nitrocellulose, wetted</i> with not less than 25 % alcohol by mass <i>Note:</i> For nitrocellulose with not less than 25 % alcohol by mass and with a nitrogen content of not more than 12,6 % by mass of the nitrocellulose, under special packing conditions, see Class 4.1 (marginal 2401, 7°)	1.3 C	EP 14 (a)	
	0343 <i>Nitrocellulose, plasticized</i> with not less than 18 % plasticizer by mass <i>Note:</i> For nitrocellulose mixtures with not more than 12,6 % nitrogen by dry mass with plasticizer, under special conditions of packing, see Class 4.1 [marginal 2401, 24° (b)]	1.3 C	EP 11	

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(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
26° (cont'd)	0406 Dinitrosobenzene	1.3 C	EP 14(b)	254, 255
	0477 Substances, explosive, n.o.s. ⁽²⁾	1.3 C	EP 01	
	0495 Propellant, liquid	1.3 C	EP 15	
	Note: Unless it can be demonstrated by testing that its sensitivity when frozen is no greater than when liquid, the propellant shall remain liquid during normal conditions of carriage and not freeze at temperatures above - 15 °C.			
27°	0499 Propellant, solid	1.3 C	EP 14(b)	256
	Articles classified as 1.3 C			
	0183 Rockets with inert head	1.3 C	EP 30	
	0186 Rocket motors	1.3 C	EP 30	
	0242 Charges, propelling, for cannon	1.3 C	EP 30	
	0272 Charges, propelling	1.3 C	EP 43	
	0275 Cartridges, power device	1.3 C	EP 34	
	0277 Cartridges, oil well	1.3 C	EP 34	
	0327 Cartridges for weapons, blank or cartridges, small arms, blank	1.3 C	EP 30	
	0417 Cartridges for weapons, inert projectile or cartridges, small arms	1.3 C	EP 30	
	0437 Rockets with expelling charge	1.3 C	EP 30	
	0447 Cases, combustible, empty, without primer	1.3 C	EP 36	
	0470 Articles, explosive, n.o.s. ⁽²⁾	1.3 C	EP 01	
28°	Articles classified as 1.3 F			
	(reserved)	1.3 F		
29°	Substances classified as 1.3 G			263
	0305 Flash powder	1.3 G	EP 13	
	0478 Substances, explosive, n.o.s. ⁽²⁾	1.3 G	EP 01	
30°	Articles classified as 1.3 G			
	0010 Ammunition, incendiary with or without burster, expelling charge or propelling charge	1.3 G	EP 30	
	0016 Ammunition, smoke with or without burster, expelling charge or propelling charge	1.3 G	EP 30	
	0019 Ammunition, tear-producing with burster, expelling charge or propelling charge	1.3 G	EP 30	
	0050 Cartridges, flash	1.3 G	EP 35	
	0054 Cartridges, signal	1.3 G	EP 35	
	0092 Flares, surface	1.3 G	EP 35	

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.

⁽²⁾ Carriage only with the approval of the competent authority [see marginal 2100 (3)].

2101
(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
30° (cont'd)	0093 <i>Flares, aerial</i>	1.3 G	EP 35	
	0101 <i>Fuse, non-detonating</i>	1.3 G	EP 40	
	0195 <i>Signals, distress, ship</i>	1.3 G	EP 35	
	0212 <i>Tracers for ammunition</i>	1.3 G	EP 33	
	0240 <i>Rockets, line-throwing</i>	1.3 G	EP 30	
	0254 <i>Ammunition, illuminating, with or without burster, expelling charge or propelling charge</i>	1.3 G	EP 30	
	0299 <i>Bombs, photoflash</i>	1.3 G	EP 30	
	0315 <i>Igniters</i>	1.3 G	EP 42	
	0316 <i>Fuzes, igniting</i>	1.3 G	EP 41	
	0318 <i>Grenades, practice, hand or rifle</i>	1.3 G	EP 41	
	0319 <i>Primers, tubular</i>	1.3 G	EP 33	
	0335 <i>Fireworks</i>	1.3 G	EP 35	
	0424 <i>Projectiles, inert with tracer</i>	1.3 G	EP 30	
	0430 <i>Articles, pyrotechnic for technical purposes</i>	1.3 G	EP 35	
	0487 <i>Signals, smoke</i>	1.3 G	EP 35	
	0488 <i>Ammunition, practice</i>	1.3 G	EP 30	
	0492 <i>Signals, railway track, explosive</i>	1.3 G	EP 35	
31°	<i>Articles classified as 1.3 H</i>			
	0244 <i>Ammunition, incendiary, white phosphorus with burster, expelling charge or propelling charge</i>	1.3 H	EP 30	
	0246 <i>Ammunition, smoke, white phosphorus with burster, expelling charge or propelling charge</i>	1.3 H	EP 30	
32°	<i>Articles classified as 1.3 J</i>			
	0247 <i>Ammunition, incendiary, liquid or gel, with burster, expelling charge or propelling charge</i>	1.3 J	EP 01	
	0396 <i>Rocket motors, liquid fuelled</i>	1.3 J	EP 01	
	0450 <i>Torpedoes, liquid fuelled, with inert head</i>	1.3 J	EP 01	
33°	<i>Substances classified as 1.3 L</i>			
	0359 <i>Substances, explosive, n.o.s.</i> ⁽²⁾	1.3 L	EP 01	
34°	<i>Articles classified as 1.3 L</i>			
	0249 <i>Contrivances, water-activated with burster, expelling charge or propelling charge</i>	1.3 L	EP 44	259
	0250 <i>Rocket motors with hypergolic liquids, with or without expelling charge</i>	1.3 L	EP 01	
	0356 <i>Articles, explosive, n.o.s.</i>	1.3 L	EP 01	

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.⁽²⁾ Carriage only with the approval of the competent authority [see marginal 2100 (3)].

2101
(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
35°	Articles classified as 1.4 B			
	0255 Detonators, electric, for blasting	1.4 B	EP 31	
	0257 Fuzes, detonating	1.4 B	EP 41	
	0267 Detonators, non-electric, for blasting	1.4 B	EP 31	
	0350 Articles, explosive, n.o.s. ⁽²⁾	1.4 B	EP 01	
	0361 Detonator assemblies, non-electric, for blasting	1.4 B	EP 31	
	0365 Detonators for ammunition	1.4 B	EP 33	
	0378 Primers, cap type	1.4 B	EP 33	
	0383 Components, explosive train, n.o.s. ⁽²⁾	1.4 B	EP 01	
36°	Substances classified as 1.4 C			
	0407 Tetrazol-1-acetic acid	1.4 C	EP 14(b)	
	0448 5-Mercaptotetrazol-1-acetic acid	1.4 C	EP 14(b)	
	0479 Substances, explosive, n.o.s. ⁽²⁾	1.4 C	EP 01	
37°	Articles classified as 1.4 C			
	0276 Cartridges, power device	1.4 C	EP 34	
	0278 Cartridges, oil well	1.4 C	EP 34	
	0338 Cartridges for weapons, blank or cartridges, small arms, blank	1.4 C	EP 30	
	0339 Cartridges for weapons, inert projectile or cartridges, small arms	1.4 C	EP 30	
	0351 Articles, explosive, n.o.s. ⁽²⁾	1.4 C	EP 01	
	0379 Cases, cartridge, empty with primer	1.4 C	EP 36	
	0438 Rockets with expelling charge	1.4 C	EP 30	
	0446 Cases, combustible, empty, without primer	1.4 C	EP 36	
	0491 Charges propelling	1.4 C	EP 43	256
38°	Substances classified as 1.4 D			
	0480 Substances, explosive, n.o.s. ⁽²⁾	1.4 D	EP 01	
39°	Articles classified as 1.4 D			
	0104 Cord (fuse), detonating, mild effect, metal clad	1.4 D	EP 39	258
	0237 Charges, shaped, flexible, linear	1.4 D	EP 38	
	0289 Cord, detonating, flexible	1.4 D	EP 39	258
	0344 Projectiles with bursting charge	1.4 D	EP 30	
	0347 Projectiles with burster or expelling charge	1.4 D	EP 30	

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.⁽²⁾ Carriage only with the approval of the competent authority [see marginal 2100 (3)].

2101
(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
39° (cont'd)	0352 Articles, explosive, n.o.s. ⁽²⁾	1.4 D	EP 01	257
	0370 Warheads, rocket, with burster or expelling charge	1.4 D	EP 30	
	0410 Fuzes, detonating, with protective features	1.4 D	EP 41	
	0440 Charges, shaped, commercial, without detonator	1.4 D	EP 37	
	0444 Charges, explosive, commercial, without detonator	1.4 D	EP 37	
	0459 Charges, bursting, plastics bonded	1.4 D	EP 30	
	0494 Jet perforating guns, charged oil well, without detonator	1.4 D	EP 01	
40°	Articles classified as 1.4 E			
	0412 Cartridges for weapons, with bursting charge	1.4 E	EP 30	
	0471 Articles, explosive, n.o.s. ⁽²⁾	1.4 E	EP 01	
41°	Articles classified as 1.4 F			
	0348 Cartridges for weapons, with bursting charge	1.4 F	EP 30	
	0371 Warheads, rocket, with burster or expelling charge	1.4 F	EP 30	
	0427 Projectiles, with burster or expelling charge	1.4 F	EP 30	
	0472 Articles, explosive, n.o.s. ⁽²⁾	1.4 F	EP 01	
42°	Substances classified as 1.4 G			
	0485 Substances, explosive, n.o.s. ⁽²⁾	1.4 G	EP 01	
43°	Articles classified as 1.4 G			
	0066 Cord, igniter	1.4 G	EP 40	
	0103 Fuse, igniter, tubular metal clad	1.4 G	EP 40	
	0191 Signal devices, hand	1.4 G	EP 35	
	0197 Signals, smoke	1.4 G	EP 35	
	0297 Ammunition, illuminating, with or without burster, expelling charge or propelling charge	1.4 G	EP 30	
	0300 Ammunition, incendiary with or without burster, expelling charge or propelling charge	1.4 G	EP 30	
	0301 Ammunition, tear-producing, with burster, expelling charge or propelling charge	1.4 G	EP 30	
	0303 Ammunition, smoke with or without burster, expelling charge or propelling charge	1.4 G	EP 30	
	0306 Tracers for ammunition	1.4 G	EP 33	
	0312 Cartridges, signal	1.4 G	EP 35	
	0317 Fuzes, igniting	1.4 G	EP 41	
	0320 Primers, tubular	1.4 G	EP 33	

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.⁽²⁾ Carriage only with the approval of the competent authority [see marginal 2100 (3)].

2101
(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
43° (cont'd)	0325 Igniters	1.4 G	EP 42	
	0336 Fireworks	1.4 G	EP 35	
	0353 Articles, explosive, n.o.s. ⁽²⁾	1.4 G	EP 01	
	0362 Ammunition, practice	1.4 G	EP 30	
	0363 Ammunition, proof	1.4 G	EP 30	
	0403 Flares, aerial	1.4 G	EP 35	
	0425 Projectiles, inert with tracer	1.4 G	EP 30	
	0431 Articles, pyrotechnic for technical purposes	1.4 G	EP 35	
	0435 Projectiles with burster or expelling charge	1.4 G	EP 30	
	0452 Grenades, practice, hand or rifle	1.4 G	EP 41	
	0453 Rockets, line throwing	1.4 G	EP 30	
	0493 Signals, railway track, explosive	1.4 G	EP 35	
44°	Substances classified as 1.4 L (reserved)	1.4 L		
45°	Articles classified as 1.4 L (reserved)	1.4 L		
46°	Substances classified as 1.4 S			
	0481 Substances, explosive, n.o.s. ⁽²⁾	1.4 S	EP 01	
47°	Articles classified as 1.4 S			
	0012 Cartridges for weapons, inert projectile or cartridges, small arms	1.4 S	EP 30	
	0014 Cartridges for weapons, blank or cartridges, small arms, blank	1.4 S	EP 30	
	0044 Primers, cap type	1.4 S	EP 33	
	0055 Cases, cartridge, empty, with primer	1.4 S	EP 36	
	0070 Cutters, cable, explosive	1.4 S	EP 34	
	0105 Fuse, safety	1.4 S	EP 40	
	0110 Grenades, practice, hand or rifle	1.4 S	EP 41	
	0131 Lighters, fuse	1.4 S	EP 42	
	0173 Release devices, explosive	1.4 S	EP 34	
	0174 Rivets, explosive	1.4 S	EP 34	
	0193 Signals, railway track, explosive	1.4 S	EP 35	

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.⁽²⁾ Carriage only with the approval of the competent authority [see marginal 2100 (3)].

2101
(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
47° (cont'd)	0323 Cartridges, power device	1.4 S	EP 34	
	0337 Fireworks	1.4 S	EP 35	
	0345 Projectiles, inert, with tracer	1.4 S	EP 30	
	0349 Articles, explosive, n.o.s. ⁽²⁾	1.4 S	EP 01	
	0366 Detonators for ammunition	1.4 S	EP 33	
	0367 Fuzes, detonating	1.4 S	EP 41	
	0368 Fuzes, igniting	1.4 S	EP 41	
	0373 Signal devices, hand	1.4 S	EP 35	
	0376 Primers, tubular	1.4 S	EP 33	
	0384 Components, explosive train, n.o.s. ⁽²⁾	1.4 S	EP 01	
	0404 Flares, aerial	1.4 S	EP 35	
	0405 Cartridges, signal	1.4 S	EP 35	
	0432 Articles, pyrotechnic for technical purposes	1.4 S	EP 35	
	0441 Charges, shaped, commercial, without detonator	1.4 S	EP 37	257
	0445 Charges, explosive, commercial, without detonator	1.4 S	EP 37	
	0454 Igniters	1.4 S	EP 42	
	0455 Detonators, non-electric, for blasting	1.4 S	EP 31	
	0456 Detonators, electric, for blasting	1.4 S	EP 31	
	0460 Charges, bursting, plastics bonded	1.4 S	EP 30	
	0500 Detonator assemblies, non-electric for blasting	1.4 S	EP 31	
48°	Substances classified as 1.5 D			
	0331 Explosive, blasting, type B	1.5 D	EP 16 or EP 17	
	Note: The word 'AGENT' may be used instead of 'EXPLOSIVE' when approved by the com- petent authority.			
	0332 Explosive, blasting, type E	1.5 D	EP 16 or EP 17	
	Note: The word 'AGENT' may be used instead of 'EXPLOSIVE' when approved by the com- petent authority.			
	0482 Substances, explosive, very insensitive, n.o.s. (Sub- stances, EVI, n.o.s.) ⁽²⁾	1.5 D	EP 01	
49°	(reserved)			

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.⁽²⁾ Carriage only with the approval of the competent authority [see marginal 2100 (3)].

2101
(cont'd)

Item	Identification number and name of the substance or article ⁽¹⁾	Classification code in accordance with marginal 2100 (6) and (7)	Packing	
			Packing methods [see marginal 2103 (3)]	Special packing requirements [see marginal 2103 (4)]
1	2	3	4	5
50°	Articles classified as 1.6 N <i>0486 Articles, explosive, extremely insensitive (articles EEI)</i>	1.6 N	EP 01	
51°	Samples, explosive <i>0190 Samples, explosive</i> ⁽²⁾ other than initiating explosive	⁽³⁾	EP 01	16
91°	Empty packagings <i>Empty packagings, uncleaned</i>	—	—	—

⁽¹⁾ The identification numbers are taken from the Recommendations on the Transport of Dangerous Goods.

⁽²⁾ Carriage only with the approval of the competent authority [see marginal 2100 (3)].

⁽³⁾ Division and Compatibility Group should be defined as directed by the competent authority and according to the principles in marginal 2100 (4).

2. Conditions of carriage

A. Packages

1. General conditions of packing

2102

(1) All explosive substances and articles, as prepared for carriage, shall have been classified in accordance with the procedures detailed in marginal 2100.

(2) All packagings for Class 1 goods should be so designed and constructed that:

(a) 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 carriage including foreseeable changes in temperature, humidity and pressure;

(b) the complete package can be handled safely in normal conditions of transport; and

(c) 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.

(3) The packages shall conform to the requirements of Appendices A.5 or A.6, in particular to the requirements for the testing of packagings in Section IV of these appendices, subject to marginals 3500 (12) and 3512 (5).

(4) In accordance with the provisions of marginals 2100 (5), 3511 (2) and 3611(2) packagings or IBCs of packing group II marked with the letter 'Y' shall be used for substances and articles of Class 1.

(5) The closure device of packagings containing liquid explosives shall ensure a double protection against leakage.

(6) 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.

2102 (7) Packagings for water soluble explosives shall be water resistant. Packagings for desensitized or
(*cont'd*) phlegmatized substances shall be closed to prevent changes in concentration during carriage.

(8) 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.

(9) 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.

(10) 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 substance from becoming loose in the outer packaging under normal conditions of carriage. 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.

(11) 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.

(12) The ingress of explosive substances into the recesses of seamed metal packagings shall be prevented.

(13) 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.

(14) 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 carried unpackaged. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of carriage. 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.

(15) 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.

(16) 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 (1A2, 1B2, 4A, 4B and metal receptacles), the metal packaging shall be provided with an inner liner or coating [see marginal 3500 (2)].

2. *Special conditions of packing*

2103 (1) Substances and articles shall be packed as indicated in marginal 2101, Table 1, columns 4 and 5, and as set out in detail in paragraphs (3), Table 2 and (4), Table 3.

(2) Notwithstanding the explosive packing methods required in marginal 2101, Table 1, columns (4) and (5) and in paragraph (3) below, Table 2, EP 01 may be adopted for any explosive substance or article provided the product as packaged has been tested by the competent authority of the country of origin and proved to present no greater hazard than that presented when the product is packed by the method specified in Table 1, column 4.

2103
(cont'd)

(3) Table 2: Packing Methods

Note: 1. In Table 2, the following convention is used:

Packing method EP 01 — reserved for methods requiring competent authority approval;

Packing methods EP 10 to EP 29 — reserved for explosive substances; and

Packing methods EP 30 onwards — reserved for explosive articles.

2. Whenever Boxes, natural wood, ordinary (4C1) are listed in this Table, a Box, natural wood, sift-proof walls (4C2) may be used instead.
3. Leakproof packagings shall correspond to a design type that has passed the leakproofness test for Packing Group II.
4. The term receptacle used in the Inner and Intermediate packaging columns of this table includes boxes, bottles, cans, drums, jars and tubes, including any means of closure.
5. Reels are devices made of plastics, wood, fibreboard, metal or other suitable material comprising a central spindle with, or without, side walls at each end of the spindle. Articles and substances can be wound onto the spindle and may be retained by side walls.
6. Trays are sheets of metal, plastics, wood, fibreboard or other suitable material which are placed in the inner, intermediate or outer packaging and achieve a close-fit in such packaging. The surface of the tray may be shaped so that packagings or articles can be inserted, held secure and separated from each other.
7. Some identification numbers cover substances which may be transported dry or wetted. Where appropriate, the heading of the packing method indicates whether it is suitable for the dry, powder or wetted substance.

METHOD EP 01

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
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As approved by the competent authority of the country of origin. The State's distinguishing sign for motor vehicles in international traffic of the country for which the authority acts, should be marked on the shipping documents as follows:

'Packaging approved by the competent authority of ...'

Division, Compatibility group and identification number:

- 1.1 A : 0473
- 1.1 B : 0461
- 1.1 C : 0462, 0474
- 1.1 D : 0124, 0463, 0475
- 1.1 E : 0464
- 1.1 F : 0465
- 1.1 G : 0476
- 1.1 J : 0397, 0399, 0449
- 1.1 L : 0354, 0357
- 1.2 B : 0382
- 1.2 C : 0466
- 1.2 D : 0467
- 1.2 E : 0468
- 1.2 F : 0469
- 1.2 J : 0395, 0398, 0400
- 1.2 K : 0020
- 1.2 L : 0322, 0355, 0358, 0380
- 1.3 C : 0470, 0477

2103	1.3 G : 0478
<i>(cont'd)</i>	1.3 J : 0247, 0396, 0450
	1.3 K : 0021
	1.3 L : 0250, 0356, 0359
	1.4 B : 0350, 0383
	1.4 C : 0351, 0479
	1.4 D : 0352, 0480, 0494
	1.4 E : 0471
	1.4 F : 0472
	1.4 G : 0353, 0485
	1.4 S : 0349, 0384, 0481
	1.5 D : 0482
	1.6 N : 0486
	Other : 0190

Special packing requirements according to marginal 2103(4):

16 for 0190

METHOD EP 10 a)

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics textile, plastic coated or lined rubber textile, rubberized textile	Bags plastics textile, plastic coated or lined rubber textile, rubberized Receptacles plastics metal	Drums steel, removable head (1A2) plastics, removable head (1H2)

Division, Compatibility group and identification number:

1.1 A : 0074, 0113, 0114, 0129, 0130, 0135, 0224

Special provisions: see marginal 2102 (8)

- Note:* 1. The intermediate packagings should be filled with water saturated material such as an anti-freeze solution or wetted cushioning.
2. Outer packagings should be filled with water saturated material such as an anti-freeze solution or wetted cushioning. Outer packagings should be constructed and sealed to prevent evaporation of the wetting solution, except when 0224 is being carried dry.

METHOD EP 10 b)

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
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)

2103*(cont'd)*

Division, Compatibility group and identification number:

1.1 A : 0074, 0113, 0114, 0129, 0130, 0135, 0224

Special packing requirements according to marginal 2103(4):

265 for 0074, 0113, 0114, 0129, 0130, 0135, 0224

METHOD EP 11

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, waterproofed plastics textile, rubberized Sheets plastics textile, rubberized	Not necessary	Drums steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibreboard (1G) plastics, removable head (1H2) Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2)

Division, Compatibility group and identification number:

1.1 C : 0433

1.3 C : 0159, 0343

Special provisions: see marginal 2102 (7)

Note: Inner packagings are not required for 0159 when metal (1A2 or 1B2) or plastics (1H2) drums are used as outer packagings.

METHOD EP 12 a) (solid wetted 1.1D)

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, multiwall, water resistant plastics textile textile, rubberized woven plastics Receptacles metal plastics	Bags plastics textile, plastic coated or lined Receptacles metal plastics	Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

2103
(*cont'd*) Division, Compatibility group and identification number:

1.1 D: 0004, 0072, 0076, 0078, 0118, 0133, 0146, 0150, 0151, 0154, 0209, 0214, 0215, 0219, 0220, 0226, 0266, 0282, 0340, 0391, 0394, 0401

Special packing requirements according to marginal 2103(4):

253 for 0004, 0076, 0078, 0154, 0219, 0394

Note: 1. Intermediate packagings are not required if leakproof drums are used as the outer packaging.

2. Intermediate packagings are not required for 0072 and 0226.

METHOD EP 12 b) (solid dry, other than powder 1.1D)

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, Kraft paper, multiwall, water resistant plastics textile textile, rubberized woven plastics	Bags (for 0150 only) plastics textile, plastic coated or lined	Bags woven plastics, sift-proof (5H2/3) plastics, film (5H4) textile, sift-proof (5L2) textile, water resistant (5L3) paper, multiwall, water resistant (5M2) Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

Division, Compatibility group and identification number:

1.1 D: 0004, 0076, 0078, 0079, 0118, 0146, 0147, 0150, 0151, 0153, 0154, 0155, 0207, 0208, 0209, 0213, 0214, 0215, 0216, 0217, 0218, 0219, 0220, 0222, 0223, 0266, 0282, 0340, 0341, 0385, 0386, 0387, 0388, 0389, 0390, 0391, 0392, 0393, 0401, 0402, 0411, 0483, 0484, 0489, 0490, 0496

Special packing requirements according to marginal 2103(4):

253 for 0004, 0076, 0078, 0154, 0216, 0219, 0386

262 for 0209

Note: Inner packagings are not required for 0222 and 0223 when the outer packaging is a bag.

2103
(cont'd)

METHOD EP 12 c) (for solid dry powder 1.1D)

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
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	Boxes steel (4A) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G)

Division, Compatibility group and identification number:

1.1 D: 0004, 0076, 0078, 0079, 0118, 0146, 0151, 0153, 0154, 0155, 0207, 0208, 0209, 0213, 0214, 0215, 0216, 0217, 0218, 0219, 0220, 0222, 0223, 0266, 0282, 0385, 0386, 0387, 0388, 0389, 0390, 0392, 0401, 0402, 0411, 0483, 0484, 0489, 0490, 0496

Special packing requirements according to marginal 2103(4):

253 for 0004, 0076, 0078, 0154, 0216, 0219, 0386

262 for 0209

Note: 1. Intermediate packagings are not required if drums are used as the outer packaging.

2. These packages should be sift-proof.

METHOD EP 13

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper plastics textile, rubberized Receptacles fibreboard metal plastics wood Sheets paper, kraft paper, waxed	Not necessary	Boxes steel (4A) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) Drums steel, removable head (1A2) steel, removable head (1B2) fibre (1G)

Division, Compatibility group and identification number:

1.1 D: 0027, 0028

1.1 G: 0094

1.3 G: 0305

Special provision:

see marginal 2102(16) for 0027 when inner packagings are not used

2103 Special packing requirements according to marginal 2103(4):

(cont'd)

263 for 0094, 0305

Note: 1. Inner packagings are not necessary for 0027 when drums are used as the outer packaging.

2. Packages should be sift-proof.

3. Sheets may only be used for 0028.

METHOD EP 14 a) (solid wetted)

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics textile woven plastics Receptacles metal plastics	Bags plastics textile, plastic coated or lined Receptacles metal plastics	Boxes steel (4A) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

Division, Compatibility group and identification number:

1.3 C: 0077, 0234, 0235, 0236, 0342

Special packing requirements according to marginal 2103(4):

253 for 0077, 0234, 0235, 0236

Note: 1. Inner packagings are not required for 0342 when metal (1A2 or 1B2) or plastics (1H2) drums are used as outer packagings.

2. Intermediate packagings are not required if leakproof removable head drums are used as the outer packaging.

METHOD EP 14 b) (solid dry)

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, kraft plastics textile, sift-proof woven plastics, sift-proof Receptacles fibreboard metal paper plastics woven plastics, sift-proof	Not necessary	Boxes natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) Drums steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

2103 Division, Compatibility group and identification number:

(cont'd)

1.1 C: 0160, 0498

1.3 C: 0077, 0132, 0161, 0234, 0235, 0236, 0406, 0499

1.4 C: 0407, 0448

Special provisions:

see marginal 2102(16) for 0160 and 0161, when metal drums (1A2 or 1B2) are used as the outer packaging.

Special packing requirements according to marginal 2103(4):

253 for 0077, 0132, 0234, 0235, 0236

256 for 0160 and 0161, when metal drums (1A2 or 1B2) are used as the outer packaging.

Note: Inner packagings are not required for 0160 and 0161 if drums are used as the outer packaging.**METHOD EP 15**

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Receptacles metal plastics	Bags plastics in metal receptacles Drums metal	Boxes natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) Drums steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G)

Division, Compatibility group and identification number:

1.1 C: 0497

1.1 D: 0075, 0143, 0144

1.3 C: 0495

Special packing requirements according to marginal 2103(4):

254 for 0075, 0143, 0495 and 0497 when boxes are used as the outer packaging.

255 for 0075, 0143, 0495 and 0497 when drums are used as the outer packaging.

264 for 0144

Note: 1. metal receptacles as inner packagings may only be used for 0144.

2. bags are to be used as intermediate packagings for 0075, 0143, 0495 and 0497 when boxes are used as outer packagings.
3. drums are to be used as intermediate packagings for 0075, 0143, 0495 and 0497 when drums are used as outer packagings.
4. intermediate packagings are not necessary for 0144.
5. fibreboard boxes (4G) may only be used for 0144.
6. aluminium drums, removable head (1B2) are not allowed for 0144.

2103
(cont'd)

METHOD EP 16

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
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 (5H1/2/3) — paper, multiwall, water resistant (5M2) plastics, film (5H4) textile, sift-proof (5L3) textile, water resistant (5L3) Boxes steel (4A) aluminium (4B) natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2) Jerrycans steel, removable head (3A2) plastics, removable head (3H2)

Division, Compatibility group and identification number:

1.1 D: 0081, 0082, 0083, 0241

1.5 D: 0331, 0332

Special packing requirements according to marginal 2103(4):

267 for 0083

Note: 1. Inner packagings are not necessary for 0082, 0241, 0331 and 0332 if leakproof removable head drums are used as the outer packaging.

2. Inner packagings are not required for 0082, 0084, 0241, 0331 and 0332 when the explosive is contained in a material impervious to liquid.

3. Inner packagings are not required for 0081 when contained in rigid plastic which is impervious to nitric esters.

4. Inner packagings are not required for 0331 when Bags (5H2), (5H3) or (5H4) are used as outer packagings.

5. Bags (5H2) and (5H3) should be used only for 0082, 0241, 0331 and 0332.

6. Bags should not be used as outer packagings for 0081.

2103
(cont'd)

METHOD EP 17

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Not necessary	Not necessary	IBC's metal (11A), (11B), (11N), (21A), (21B), (21N), (31A), (31B), (31N) flexible (13H2), (13H3), (13H4), (13L2), (13L3), (13L4), (13M2) rigid plastics (11H1), (11H2), (21H1), (21H2), (31H1), (31H2) composite (11HZ1), (11HZ2), (21HZ1), (21HZ2), (31HZ1), (31HZ2)

Division, Compatibility group and identification number:

1.1 D: 0082, 0241

1.5 D: 0331, 0332

Special packing requirements according to marginal 2103(4):

260 for 0082

261 for 0241

Note: 1. IBCs should only be used for free flowing substances.

2. metal IBCs should not be used for 0082 and 0241.

3. flexible IBCs should be used for solids only.

METHOD EP 30

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Not necessary	Not necessary	Boxes steel (4A) aluminium (4B) wood natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

2103 Division, Compatibility group and identification number:

(cont'd)

- 1.1 C : 0279, 0280, 0326
 1.1 D : 0034, 0038, 0048, 0056, 0137, 0168, 0221, 0286, 0451, 0457
 1.1 E : 0006, 0181, 0329
 1.1 F : 0005, 0033, 0037, 0136, 0167, 0180, 0330, 0369
 1.2 C : 0281, 0328, 0413, 0414, 0436
 1.2 D : 0035, 0138, 0169, 0287, 0458
 1.2 E : 0182, 0321
 1.2 F : 0007, 0291, 0294, 0295, 0324, 0426
 1.2 G : 0009, 0015, 0018, 0039, 0171, 0238, 0434
 1.2 H : 0243, 0245
 1.3 C : 0183, 0186, 0242, 0327, 0417, 0437
 1.3 G : 0010, 0016, 0019, 0240, 0254, 0299, 0424, 0488
 1.3 H : 0244, 0246
 1.4 C : 0338, 0339, 0438
 1.4 D : 0344, 0347, 0370, 0459
 1.4 E : 0412
 1.4 F : 0348, 0371, 0427
 1.4 G : 0297, 0300, 0301, 0303, 0362, 0425, 0435, 0453
 1.4 S : 0012, 0014, 0345, 0460

Special provisions:

see marginal 2102(14) for all identification numbers, except for 0005, 0007, 0012, 0014, 0033, 0037, 0136, 0167, 0180, 0238, 0240, 0242, 0279, 0291, 0294, 0295, 0324, 0326, 0327, 0330, 0338, 0339, 0348, 0369, 0371, 0413, 0414, 0417, 0426, 0427, 0453, 0457, 0458, 0459, 0460.

see marginal 2102(16) for 0457, 0458, 0459, 0460.

METHOD EP 31

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper plastics Receptacles fibreboard metal plastics wood Reels	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

Division, Compatibility group and identification number:

- 1.1 B : 0029, 0030, 0360
 1.4 B : 0255, 0267, 0361
 1.4 S : 0455, 0456, 0500

Note: 1. Bags should not be used as inner packagings for 0029, 0267 and 0455.

2. Reels should only be used as inner packagings for 0030, 0255, 0360, 0361, 0456 and 0500.

2103

(cont'd)

METHOD EP 32 a)

Articles consisting of closed metal, plastics or fibreboard casings that contain a detonating explosive, or consisting of plastics-bonded detonating explosives

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Not necessary	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)

Division, Compatibility group and identification number:

1.1 D: 0042, 0060

1.2 D: 0283

METHOD EP 32 b)

Articles without closed casings

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Receptacles fibreboard metal plastics Sheets paper plastics	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)

Division, Compatibility group and identification number:

1.1 D: 0042, 0060

1.2 D: 0283

Special provisions:

see marginal 2102 (16) for 0042, 0060 en 0283

METHOD EP 33

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Receptacles fibreboard metal plastics wood Trays, fitted with dividing partitions fibreboard plastics wood	Receptacles fibreboard metal plastics wood	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)

2103 Division, Compatibility group and identification number:

(cont'd)

1.1 B : 0073, 0225, 0377

1.1 D : 0043

1.2 B : 0268, 0364

1.3 G : 0212, 0319

1.4 B : 0365, 0378

1.4 G : 0306, 0320

1.4 S : 0044, 0366, 0376

Note: 1. Trays should only be used as inner packagings for 0044, 0073, 0319, 0320, 0364, 0365, 0366, 0376, 0377 and 0378.

2. Receptacles are only required as intermediate packagings when the inner packagings are trays.

METHOD EP 34

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags water resistant Receptacles fibreboard metal plastics wood Sheets fibreboard, corrugated Tubes fibreboard	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2)

Division, Compatibility group and identification number:

1.1 D : 0099, 0374

1.1 F : 0296

1.2 C : 0381

1.2 D : 0375

1.2 F : 02041

1.3 C : 0275, 0277

1.4 C : 0276, 0287

1.4 S : 0070, 0173, 0174, 0323

2103
(cont'd)

METHOD EP 35

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper plastics Receptacles fibreboard metal plastics wood Sheets paper plastics	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

Division, Compatibility group and identification number:

1.1 G: 0049, 0192, 0194, 0196, 0333, 0418, 0420, 0428

1.2 G: 0313, 0334, 0419, 0421, 0429

1.3 G: 0050, 0054, 0092, 0093, 0195, 0335, 0430, 0487, 0492

1.4 G: 0191, 0197, 0312, 0336, 0403, 0431, 0493

1.4 S: 0193, 0337, 0373, 0404, 0405, 0432

METHOD EP 36

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics textile Boxes fibreboard plastics wood Dividing partitions in the outer packagings	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

Division, Compatibility group and identification number:

1.3 C: 0447

1.4 C: 0379, 0446

1.4 S: 0055

2103

(cont'd)

METHOD EP 37

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics Boxes fibreboard Tubes fibreboard metal plastics Dividing partitions in the outer packagings	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G)

Division, Compatibility group and identification number:

1.1 D : 0059, 0442

1.2 D : 0439, 0443

1.4 D : 0440, 0444

1.4 S : 0441, 0445

Special packing requirements according to marginal 2103(4):

257: for 0059, 0439, 0440 and 0441

METHOD EP 38

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2)

Division, Compatibility group and identification number:

1.1 D : 0288

1.4 D : 0237

Special provisions:

see marginal 2102 (16) for 0237 and 0288

Note: If the ends of the articles are sealed, inner packagings are not necessary.

2103
(cont'd)

METHOD EP 39

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics Recepracles fibreboard metal plastics wood Reels Sheets paper plastics	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

Division, Compatibility group and identification number:

1.1 D : 0065, 0290

1.2 D : 0102

1.4 D : 0104, 0289

Special packing requirements according to marginal 2103(4):

258 for 0065, 0102, 0104, 0289 and 0290

Note: Inner packagings are not required for 0065 and 0289 when they are in coils.

METHOD EP 40

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics Reels Sheets paper, kraft plastics	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G)

Division, Compatibility group and identification number:

1.3 G : 0101

1.4 G : 0066, 0103

1.4 S : 0105

Special provisions:

see marginal 2102 (16) for 0105

Note: 1. If the ends of 0105 are sealed, no inner packagings are required.

2. For 0101, the packaging should be sift-proof except when the fuse is covered by a paper tube and both ends of the tube are covered with removable caps.

3. steel and aluminium (boxes and drums) may not be used for 0101.

2103

(cont'd)

METHOD EP 41

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
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) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

Division, Compatibility group and identification number:

1.1 B : 0106
1.1 D : 0284, 0408
1.1 F : 0292
1.2 B : 0107
1.2 D : 0285, 0409
1.2 F : 0293
1.2 G : 0372
1.3 G : 0316, 0318
1.4 B : 0257
1.4 D : 0410
1.4 G : 0317, 0452
1.4 S : 0110, 0367, 0368

METHOD EP 42

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper plastics Receptacles fibreboard metal plastics wood Sheets paper Trays, fitted with dividing partitions plastics	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) fibre (1G) plastics, removable head (1H2)

2103 Division, Compatibility group and identification number:

(cont'd)

1.1 G : 0121

1.2 G : 0314

1.3 G : 0315

1.4 G : 0325

1.4 S : 0131, 0454

METHOD EP 43

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, kraft plastics textile textile, rubberized Receptacles fibreboard metal plastics Trays, fitted with dividing partitions plastics wood	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) Drums steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

Division, Compatibility group and identification number:

1.1 C : 0271

1.2 C : 0415

1.3 C : 0272

1.4 C : 0491

Special packing requirements according to marginal 2103(4):

256 for 0271, 0272, 0415 and 0491, when metal packagings are used

Note: Instead of the above inner and outer packagings, composite packagings (6HH2) (plastic receptacle with outer solid plastics box) may be used.

METHOD EP 44

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Receptacles fibreboard metal plastics Dividing partitions in the outer packagings	Not necessary	Boxes steel (4A) aluminium (4B) wood, natural, ordinary (4C1) with metal liner plywood (4D) with metal liner reconstituted wood (4F) with metal liner reconstituted wood (4F) with metal liner plastics, expanded (4H1)

2103 Division, Compatibility group and identification number:

(cont'd)

1.2 L: 0271

1.3 L: 0415

Special packing requirements according to marginal 2103(4):

259 for 0248 and 0249.

(4) **Tabel 3: Special packing requirements**

Note: 1. For the special packing requirements applicable to the various substances and articles, see marginal 2101, Table 1, column 5.

2. Numbers assigned to special requirements are the same as those assigned to special provisions in Chapter 3 of the Recommendations on the transport of dangerous goods.

No	Special packing requirement
16	Explosive samples which are non-wetted or non-desensitized shall be limited to 10 kg in small packages as specified by the competent authorities. Explosive samples which are wetted or desensitized shall be limited to 25 kg.
253	Packagings shall be lead free.
254	Inner packagings shall have taped screw cap closures and be not more than 5 litres 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.
255	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 propellant in each package shall not exceed 120 litres.
256	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.
257	When the shaped charges are packed singly, the conical cavity shall face downwards and the package 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.
258	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 'cord, detonating, flexible' shall be tied fast.
259	Packagings shall be protected against the ingress of water. When 'contrivances, water activated' are carried unpackaged, they shall be provided with at least two independent protective features which prevent the ingress of water.
260	Packing method EP 17 may only be used for explosives of 0082 which 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.

2103
(cont'd)

No	Special packing requirement
261	Packing method EP 17 may only be used for explosives of 0241 which consist 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 hydrocarbons or aluminium powder, but shall not include nitro-derivatives such as trinitrotoluene.
262	Bags, sift-proof (5H2) recommended for flake or prilled TNT in the dry state and a maximum net mass of 30 kg.
263	No more than 50 g of substance shall be packed in an inner packaging.
264	Absorbent cushioning material shall be inserted.
265	The following conditions shall be satisfied: '(a) No inner packaging shall contain more than 50 g of explosive substance (quantity corresponding to dry substance); (b) No compartment between dividing partitions shall contain more than one inner packaging, firmly fitted; (c) The outer packaging shall be partitioned into up to 25 compartments.'
267	Any explosives, blasting, type C containing chlorates shall be segregated from explosives containing ammonium nitrate or other ammonium salts.

3. Mixed packing

2104

(1) Substances and articles covered by the same identification number,⁽¹⁾ with the exception of substances and articles of compatibility group L and substances and articles assigned to an n.o.s. entry or the entry 0190 Samples, Explosive of 51°, may be packed together.

(2) Except where otherwise specially provided below, substances and articles having different identification numbers may not be packed together.

(3) Substances and articles of Class 1 may not be packed together with substances of other Classes or with goods which are not subject to the provisions of this Directive.

(4) Articles of compatibility groups C, D and E may be packed together.

(5) Articles of compatibility groups D or E may be packed together with their own means of initiation provided that such means have at least two effective protective features which prevent explosion of an article in the event of accidental functioning of the means of initiation.

(6) Articles of compatibility groups D or E may be packed together with their own means of initiation which do not have two effective protective features (i.e. means of initiation assigned to compatibility group B), provided that, 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 carriage.

(7) Substances and articles of compatibility group L may not be packed together with a different type of substance or article of that compatibility group.

(8) Articles may be packed together with their own means of ignition provided that the means of ignition will not function under normal conditions of carriage.

⁽¹⁾ Identification number of the substance or article according to the Recommendations on the Transport of Dangerous Goods [see marginal 2101, footnote⁽¹⁾].

2104 (9) Goods with the identification numbers shown in table 4 may be included in the same package under the conditions indicated.

Explanations of table 4:

A: Substances and articles with these identification numbers may be included in the same package without any special limitation of mass.

B: Substances and articles with these identification numbers may be included in the same package up to a total mass of 50 kg of explosive substances.

(10) For mixed packing, account shall be taken of a possible amendment of the classification of packages in accordance with marginal 2100.

(11) For the description of goods in the transport document in the case of the mixed packing of substances and articles of Class 1, see marginal 2110 (4).

TABLE 4

Special conditions for mixed packaging [see marginal 2104 (9)]

Item	Item	2	4	9			21			26	27	30				43					47									
	Identification No	0160 0160 0267 0078	0001 0001 0293 0074	0001 0001 0293 0083	0001 0001 0293 0038	0001 0001 0293 0088	0001 0001 0293 0049	0001 0001 0293 0011	0001 0001 0293 0066	0001 0001 0293 0088	0001 0001 0293 0054	0001 0001 0293 0095	0001 0001 0293 0049	0001 0001 0293 0050	0001 0001 0293 0050	0001 0001 0293 0011	0001 0001 0293 0077	0001 0001 0293 0022	0001 0001 0293 0066	0001 0001 0293 0011	0001 0001 0293 0022	0001 0001 0293 0044	0001 0001 0293 0011	0001 0001 0293 0044	0001 0001 0293 0037	0001 0001 0293 0073	0001 0001 0293 0045	0001 0001 0293 0042		
2	0160		B	B						B																B				
4	0027	B		B						B																B				
	0028	B	B							B																B				
9	0194						B	B		B		B	B	B	B		B	B	B	B		B						B	B	B
	0333								A						A					A						A				
	0428				B		B		B		B	B	B	B		B	B	B	B		B						B	B	B	
21	0238				B		B		B		B	B	B	B		B	B	B	B		B						B	B	B	
	0334					A									A					A						A				
	0429				B		B	B				B	B	B	B		B	B	B	B		B					B	B	B	
26	0161	B	B	B																						B				
27	0186				B		B	B		B		B	B	B		B	B	B	B		B						B	B	B	
30	0054				B		B	B		B		B	B	B		B	B	B	B		B						B	B	B	
	0195				B		B	B		B		B	B	B		B	B	B	B		B						B	B	B	
	0240				B		B	B		B		B	B	B		B	B	B	B		B						B	B	B	
	0335					A			A											A						A				
	0430				B		B	B		B		B	B	B	B		B	B	B		B						B	B	B	
43	0191				B		B	B		B		B	B	B	B		B	B	B		B						B	B	B	
	0197				B		B	B		B		B	B	B	B		B	B	B		B						B	B	B	
	0312				B		B	B		B		B	B	B	B		B	B	B		B						B	B	B	
	0336					A			A						A												A			
	0431				B		B	B		B		B	B	B	B		B	B	B	B								B	B	B
47	0012																									A				
	0014																								A					
	0044	B	B	B							B																			
	0337					A			A						A					A										
	0373				B		B	B		B		B	B	B	B		B	B	B	B		B						B	B	
	0405				B		B	B		B		B	B	B	B		B	B	B	B		B						B	B	
	0432				B		B	B		B		B	B	B	B		B	B	B	B		B						B	B	

4. Marking and danger labels on packages (see Appendix A.9)

Marking

- 2105 (1) Packages shall bear the identification number and one of the names of the substance or article printed in italics, in marginal 2101, Table 1, column 2. For substances and articles assigned to an n.o.s. entry or the entry 0190 Samples, explosive of 51°, as well as for other articles of 25° and 34°, the technical name of the goods shall be given in addition to the name of the n.o.s. entry or the entry 0190 Samples, explosive of 51°. For substances of 4°, Nos 0081, 0082, 0083, 0084 and 0241, and substances of 48°, Nos 0331 and 0332, the commercial name of the particular explosive shall be specified in addition to the type. For other substances and articles, the commercial or technical name may be added. The marking, which shall be clearly legible and indelible, shall be in an official language of the country of origin and also, if that language is not English, French or German, in English, French or German, unless any agreements concluded between the countries concerned in the transport operation provide otherwise.

Danger labels

- (2) Packages containing substances or articles of 01° to 34° shall bear a label conforming to model No 1. The classification code according to marginal 2101, Table 1, column 3, shall be shown on the lower part of the label. Packages containing substances or articles of 35° to 47° shall bear a label conforming to model No 1.4 and packages containing substances of 48° shall bear a label conforming to model No 1.5 and those containing articles of item 50° shall bear a label conforming to model No 1.6. The compatibility group according to marginal 2101, Table 1, column 3, shall be shown on the lower part of the label.

- (3) Packages containing substances and articles of

01°, No 0224

4°, Nos 0076 and 0143 (mixtures with less than 90 % (mass) phlegmatizer),

21°, No 0018,

26°, No 0077,

30°, No 0019 and

43°, No 0301

shall in addition bear a label conforming to model No. 6.1.

Packages containing articles containing one or several corrosive substances according to criteria for Class 8, of

21°, Nos 0015 and 0018⁽¹⁾,

30°, Nos 0016 and 0019⁽¹⁾ and

43°, Nos 0301 and 0303⁽¹⁾

shall in addition bear a label conforming to model No. 8.

2106-
2109

B. Particulars in the transport document

- 2110 (1) The description of the goods in the transport document shall conform to one of the identification numbers and one of the names printed in italics in marginal 2101, Table 1, column 2. For substances and articles assigned to an n.o.s. entry or the entry 0190 Samples, explosive of 51°, as well as for other articles of 25° and 34°, the technical name of the goods shall be given in addition to the name of the n.o.s. entry or the entry 0190 Samples, explosive of 51°. The description of the goods shall be followed by the *classification code and Item No.* (marginal 2101, Table 1, columns 3 and 1) and *completed by the net mass in kg of the explosive substance and the initials 'ADR' or 'RID'* (e.g.: 0160 Powder, smokeless, 1.1 C, 2°, 4 600 kg, ADR).

⁽¹⁾ For numbers 0015, 0016 and 0303, only articles containing one or several corrosive substances according to the criteria of Class 8.

2110 (2) For substances of 4°, Nos 0081, 0082, 0083, 0084 and 0241 and for substances of 48°, Nos 0331 and
(cont'd) 0332, the commercial name of the explosive shall be specified as well as the type of explosive. For other
substances and articles, the commercial name or technical name may be added.

(3) For full loads, the transport document shall indicate the number of packages, the mass of each
package in kg and the total net mass in kg of explosive substance.

(4) For mixed packing of two different goods, the description of the goods in the transport document
shall include the identification numbers and names printed in italics in marginal 2101, Table 1, column 2
of both substances or articles. If more than two different goods are contained in the same package in
conformity with marginal 2104, the transport document shall indicate under the description of the goods
the identification numbers of all the substances and articles contained in the package, in the form, 'Goods
of Nos ...'.

(5) For the carriage of substances and articles assigned to an n.o.s. entry or the entry 0190 Samples,
Explosive or packed conforming to Packing Method EP 01, a copy of the competent authority approval
with the conditions of carriage shall be attached to the transport document. It shall be in an official
language of the forwarding country and also, if that language is not English, French or German, in
English, French or German unless agreements, if any, concluded between the countries concerned in the
transport operation provide otherwise.

(6) If packages containing substances and articles of compatibility groups B and D are loaded together
in the same vehicle in accordance with the provisions of marginal 11 403 (1), the approval certificate of
the protective container/separate compartment in accordance with marginal 11 403 (1), footnote (1), shall
be attached to the transport document.

(7) When explosive substances or articles are carried in packagings conforming to Packing Method EP
01, the transport document shall bear the inscription 'Packaging approved by the competent authority of
...' (see marginal 2103, packing method EP 01).

2111-
2114

C. Empty packagings

2115 (1) Empty packagings, uncleaned, of 91° shall be securely closed and be leakproof to the same degree
as if they were full.

(2) Empty packagings, uncleaned, of 91° shall bear the same danger labels as if they were full.

(3) The entry in the transport document shall be: 'Empty packagings, 1, 91°, ADR' or 'Empty
packagings, 1, 91°, RID'.

D. Special provisions

2116 (1) Substances and articles of Class 1, belonging to the armed forces of a Member State, that were
packaged prior to 1 January 1990 in accordance with the provisions of this Directive in effect at that time
may be carried after 1 January 1990 provided the packagings maintain their integrity and are declared in
the transport document as military goods packaged prior to 1 January 1990. The other provisions
applicable as from 1 January 1990 for this Class shall be complied with.

(2) Substances and articles of class 1 that were packaged between 1 January 1990 and 31 December
1996 in accordance with the provisions of this Directive in effect at that time may be carried after 1 January
1997 provided the packagings maintain their integrity and are declared in the transport document as
goods packaged prior to 1 January 1997.

2117-
2199

CLASS 2

GASES

Replace marginals 2200 to 2299 by the following:

1. List of substances

2200

(1) Among the substances and articles covered by the title of Class 2, those which are listed in marginal 2201 or are covered by a collective entry of that marginal are subject to the conditions set out in marginals 2200 (2) to 2250 and to the provisions of this Annex and of Annex B. They are then considered as substances and articles of this Directive.

Note: For the quantities of substances and for articles listed in marginal 2201, which are not subject to the provisions for this Class, either in this Annex or in Annex B, see marginal 2201a.

(2) A gas is a substance which:

(a) at 50 °C has a vapour pressure greater than 300 kPa (3 bar); or

(b) is completely gaseous at 20 °C at the standard pressure of 101,3 kPa.

Note: 1052 Hydrogen fluoride shall nevertheless be classified in Class 8, item 6°.

(3) The title of Class 2 covers pure gases, mixtures of gases, mixtures of one or more gases with one or more other substances and articles containing such substances.

Note: 1. A pure gas may contain other components deriving from its production process or added to preserve the stability of the product, provided that the level of these components does not change its classification or its conditions of carriage, such as filling ratio, filling pressure or test pressure.

2. N.o.s. entries in marginal 2201 cover pure gases as well as mixtures.

3. For the classification of solutions and mixtures (such as preparations and wastes) see also marginal 2002(8) and paragraphs (6) and (7) of this marginal.

(4) Substances and articles of Class 2 are subdivided as follows:

1° Compressed gases: gases having a critical temperature below 20 °C;

2° Liquefied gases: gases having a critical temperature of 20 °C or above;

3° Refrigerated liquefied gases: gases which when carried are partially liquid because of their low temperature;

4° Gases dissolved under pressure: gases which when carried are dissolved in a solvent;

5° Aerosol dispensers and receptacles, small, containing gas (gas cartridges);

6° Other articles containing gas under pressure;

7° Non-pressurized gases subject to special requirements (gas samples);

8° Empty receptacles and empty tanks.

2200 (5) Substances and articles, classified under the various items of marginal 2201 are assigned to one of the following groups according to their hazardous properties, as follows⁽¹⁾:
(*cont'd*)

A	asphyxiant
O	oxidizing
F	flammable
T	toxic
TF	toxic, flammable
TC	toxic, corrosive
TO	toxic, oxidizing
TFC	toxic, flammable, corrosive
TOC	toxic, oxidizing, corrosive

For gases and gas mixtures presenting according to the criteria, hazardous properties associated with more than one group, the groups designated by letter T take precedence over all other groups. The groups designated by letter F take precedence over the groups designated by letters A or O.

Note: Corrosive gases are considered to be toxic, and are therefore assigned to the group TC, TFC or TOC see paragraph (7).

(6) If a mixture of Class 2, specifically named under an item number and group comes into a different item number and/or group on the basis of criteria mentioned in paragraphs (4) and (7), this mixture shall be classified according to the criteria and assigned to an appropriate n.o.s. entry.

(7) Substances and articles not specifically named in marginal 2201 shall be classified in accordance with paragraphs (4) and (5).

According to their hazardous properties, the following criteria shall apply:

Asphyxiant gases

Gases which are non-oxidizing, non-flammable and non-toxic and which dilute or replace oxygen normally in the atmosphere.

Flammable gases

Gases which at 20 °C and the standard pressure of 101,3 kPa:

- (a) are ignitable when in a mixture of 13 % or less by volume with air; or
- (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit.

Flammability shall be determined by tests or by calculation in accordance with methods adopted by ISO (see ISO 10156:1990).

Where insufficient data are available to use these methods, tests by a comparable method recognized by the competent authority of the country of origin may be used.

⁽¹⁾ In the Recommendations on the Transport of Dangerous Goods, the International Maritime Dangerous Goods (IMDG) Code and the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air, gases are assigned to one of the following three divisions, based on the primary hazard:

Division 2.1: flammable gases (corresponding to the groups designated by the capital letter F);

Division 2.2: non-flammable, non-toxic gases (corresponding to the groups designated by the capital letters A or O);

Division 2.3: toxic gases [corresponding to the groups designated by the capital letter T (i.e. T, TF, TC, TO, TFC and TOC)].

2200 Oxidizing gases (cont'd)

Gases, which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. Oxidizing ability is determined either by tests or by calculation methods adopted by ISO (see ISO 10156:1990).

Toxic gases

Note: Gases meeting the criteria for toxicity in part or completely owing to their corrosivity are to be classified as toxic. See also the criteria under the heading 'Corrosive' for a possible subsidiary corrosivity risk.

Gases which:

- (a) are known to be so toxic or corrosive to humans as to pose a hazard to health; or
- (b) are presumed to be toxic or corrosive to humans because they have a LC_{50} value for acute toxicity equal to or less than 5 000 ml/m³ (ppm) when tested in accordance with marginal 2600(3).

In the case of gas mixtures (including vapours of substances from other classes) the following formula may be used:

$$LC_{50} \text{ Toxic(mixture)} = \frac{1}{\sum_{i=1}^n \frac{f_i}{T_i}}$$

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 as found in ISO:10298:1995. When no LC_{50} value is listed in ISO:10298:1995, a LC_{50} value available in scientific literature shall be used. When the LC_{50} value is 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.

Corrosive gases

Gases or gas mixtures meeting the criteria for toxicity completely owing to their corrosivity are to be classified as toxic with a subsidiary corrosive risk.

A gas mixture that is considered to be toxic due to the combined effects of corrosivity and toxicity has a subsidiary risk of corrosivity when the mixture is known by human experience to be destructive to the skin, eyes or mucous membranes or when the LC_{50} value of the corrosive components of the mixture is equal to or less than 5 000 ml/m³ (ppm) when the LC_{50} is calculated by the formula:

$$LC_{50} \text{ Corrosive(mixture)} = \frac{1}{\sum_{i=1}^n \frac{f_{ci}}{T_{ci}}}$$

where: f_{ci} = mole fraction of the i^{th} corrosive component substance of the mixture

T_{ci} = toxicity index of the i^{th} corrosive component substance of the mixture. The T_{ci} equals the LC_{50} value as found in ISO:10298:1995. When no LC_{50} value is listed in ISO:10298:1995, a LC_{50} value available in scientific literature shall be used. When the LC_{50} value is 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.

2200 (8) Chemically unstable substances of Class 2 are not to be handed over for carriage, unless the necessary steps have been taken to prevent all possibility of a dangerous reaction e.g. decomposition, dismutation or polymerisation under normal conditions during transport. To this end particular care shall be taken to ensure that receptacles and tanks do not contain any substances liable to promote these reactions.

2201 1° *Compressed gases: gases having a critical temperature below 20 °C*

Gases having a critical temperature below 20 °C are considered to be compressed gases for the purposes of this Directive.

Item and group	Identification number, name and description
1°A	Asphyxiant gases (or gases presenting no subsidiary risk)
	1002 AIR, COMPRESSED
	1006 ARGON, COMPRESSED
	1046 HELIUM, COMPRESSED
	1056 KRYPTON, COMPRESSED
	1065 NEON, COMPRESSED
	1066 NITROGEN, COMPRESSED
	1979 RARE GASES MIXTURE, COMPRESSED
	1980 RARE GASES AND OXYGEN MIXTURE, COMPRESSED
	1981 RARE GASES AND NITROGEN MIXTURE, COMPRESSED
	1982 TETRAFLUOROMETHANE, COMPRESSED (REFRIGERANT GAS R 14, COMPRESSED)
	2036 XENON, COMPRESSED
	2193 HEXAFLUOROETHANE, COMPRESSED (REFRIGERANT GAS R 116, COMPRESSED)
	1956 COMPRESSED GAS, N.O.S.

Note: 1. Mixtures containing more than 21 % oxygen by volume shall be classified as oxidizing.

2. Air and other breathing mixtures are not considered to be asphyxiant.

3. Mixtures of identification number 1956, 1979, 1980 or 1981 shall not contain more than 10 % xenon.

1°O	Oxidizing gases
	1014 OXYGEN AND CARBON DIOXIDE MIXTURE, COMPRESSED
	<i>Note:</i> Mixtures of identification number 1014 shall not contain more than 30 % carbon dioxide.
	1072 OXYGEN, COMPRESSED
	3156 COMPRESSED GAS, OXIDIZING, N.O.S.
1°F	Flammable gases
	1049 HYDROGEN, COMPRESSED
	1957 DEUTERIUM, COMPRESSED
	1962 ETHYLENE, COMPRESSED
	1971 METHANE, COMPRESSED or
	1971 NATURAL GAS, COMPRESSED, with high methane content
	2034 HYDROGEN AND METHANE MIXTURE, COMPRESSED
	2203 SILANE, COMPRESSED
	<i>Note:</i> 2203 SILANE, COMPRESSED is considered to be spontaneously flammable (pyrophoric).
	1964 HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S.
	1954 COMPRESSED GAS, FLAMMABLE, N.O.S.
1°T	Toxic gases
	1612 HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE
	1955 COMPRESSED GAS, TOXIC, N.O.S.

2201
(cont'd)

Item and group	Identification number, name and description
1°TF	Toxic, flammable gases 1016 CARBON MONOXIDE, COMPRESSED 1023 COAL GAS, COMPRESSED 1071 OIL GAS, COMPRESSED 1911 DIBORANE, COMPRESSED 2600 CARBON MONOXIDE AND HYDROGEN MIXTURE, COMPRESSED (synthesis gas, water gas, Fischer Tropsch gas) 1953 COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S
1°TC	Toxic, corrosive gases 1008 BORON TRIFLUORIDE, COMPRESSED 1859 SILICON TETRAFLUORIDE, COMPRESSED 2198 PHOSPHORUS PENTAFLUORIDE, COMPRESSED 2417 CARBONYL FLUORIDE, COMPRESSED 3304 COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.
1°TO	Toxic, oxidizing gases 2451 NITROGEN TRIFLUORIDE, COMPRESSED 3303 COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S.
1°TFC	Toxic, flammable, corrosive gases 3305 COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.
1°TOC	Toxic, oxidizing, corrosive gases 1045 FLUORINE, COMPRESSED 1660 NITRIC OXIDE, COMPRESSED (nitric monoxide, compressed) 2190 OXYGEN DIFLUORIDE, COMPRESSED 3306 COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.

2° Liquefied gases: gases having a critical temperature of 20 °C or above

Gases having a critical temperature of 20 °C or above are considered to be liquefied gases for the purposes of this Directive.

Item and group	Identification number, name and description
2°A	Asphyxiant gases 1009 BROMOTRIFLUOROMETHANE (REFRIGERANT GAS R 13B1) 1013 CARBON DIOXIDE 1015 CARBON DIOXIDE AND NITROUS OXIDE MIXTURE 1018 CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22) 1020 CHLOROPENTAFLUOROETHANE (REFRIGERANT GAS R 115) 1021 1-CHLORO-1,2,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 124) 1022 CHLOROTRIFLUOROMETHANE (REFRIGERANT GAS R 13) 1028 DICHLORODIFLUOROMETHANE (REFRIGERANT GAS R 12) 1029 DICHLOROFLUOROMETHANE (REFRIGERANT GAS R 21) 1058 LIQUEFIED GASES non-flammable, charged with nitrogen, carbon dioxide or air 1080 SULPHUR HEXAFLUORIDE 1858 HEXAFLUOROPROPYLENE (REFRIGERANT GAS R 1216) 1952 ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE, with not more than 9 % ethylene oxide 1958 1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 114)

2201
(cont'd)

Item and group	Identification number, name and description
2°A (cont'd)	1973 CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE with fixed boiling point, with approximately 49 % chlorodifluoromethane (REFRIGERANT GAS R 502) 1974 CHLORODIFLUOROBROMOMETHANE (REFRIGERANT GAS R 12B1) 1976 OCTAFLUOROCYCLOBUTANE (REFRIGERANT GAS RC 318) 1983 1-CHLORO-2,2,2-TRIFLUOROETHANE (REFRIGERANT GAS R 133a) 1984 TRIFLUOROMETHANE (REFRIGERANT GAS R 23) 2422 OCTAFLUOROBUT-2-ENE (REFRIGERANT GAS R 1318) 2424 OCTAFLUOROPROPANE (REFRIGERANT GAS R 218) 2599 CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE, AZEOTROPIC MIXTURE, with approximately 60 % chlorotrifluoromethane (REFRIGERANT GAS R 503) 2602 DICHLORODIFLUOROMETHANE AND 1,1-DIFLUOROETHANE, AZEOTROPIC MIXTURE with approximately 74 % dichlorodifluoromethane (REFRIGERANT GAS R 500) 3070 DICHLORODIFLUOROMETHANE AND ETHYLENE OXIDE MIXTURE with not more than 12,5 % ethylene oxide 3159 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a) 3220 PENTAFLUOROETHANE (REFRIGERANT GAS R 125) 3296 HEPTAFLUOROPROPANE (REFRIGERANT GAS R 227) 3297 ETHYLENE OXIDE AND CHLOROTETRAFLUOROETHANE MIXTURE with not more than 8,8 % ethylene oxide 3298 ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE with not more than 7,9 % ethylene oxide 3299 ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE, with not more than 5,6 % ethylene oxide 1078 REFRIGERANT GAS, N.O.S. such as mixtures of gases, indicated by the letter R..., which as: MIXTURE F1, have a vapour pressure at 70 °C not exceeding 1,3 MPa (13 bar) and a density at 50 °C not lower than that of dichlorodifluoromethane (1,30 kg/l); MIXTURE F2, have a vapour pressure at 70 °C not exceeding 1,9 MPa (19 bar) and a density at 50 °C not lower than that of dichlorodifluoromethane (1,21 kg/l); MIXTURE F3, have a vapour pressure at 70 °C not exceeding 3 MPa (30 bar) and a density at 50 °C not lower than that of chlorodifluoromethane (1,09 kg/l) <i>Note:</i> Trichlorofluoromethane (refrigerant R 11), 1,1,2-trichloro-1,2,2-trifluoroethane (refrigerant R 113), 1,1,1-trichloro-2,2,2-trifluoroethane (refrigerant R 113a), 1-chloro-1,2,2-trifluoroethane (refrigerant R 133) and 1-chloro-1,1,2-trifluoroethane (refrigerant R 133b) are not substances of Class 2. They may, however, enter into the composition of mixtures F1 to F3. 1968 INSECTICIDE GAS, N.O.S. 3163 LIQUEFIED GAS, N.O.S.

Note: 2455 METHYL NITRITE is not to be accepted for carriage.

2°O	Oxidizing gases 1070 NITROUS OXIDE 3157 LIQUEFIED GAS, OXIDIZING, N.O.S.
2°F	Flammable 1010 1,2-BUTADIENE, INHIBITED or 1010 1,3-BUTADIENE, INHIBITED or 1010 MIXTURES OF 1,3-BUTADIENE AND HYDROCARBONS, INHIBITED, having a vapour pressure at 70 °C not exceeding 1,1 MPa (11 bar) and a density at 50 °C not lower than 0,525 kg/l. <i>Note:</i> In receptacles containing 1,2-butadiene, the oxygen concentration in the gaseous phase shall not exceed 50 ml/m³. 1011 BUTANE 1012 BUTYLENES MIXTURE or 1012 1-BUTYLENE or 1012 TRANS-2-BUTYLENE or 1012 CIS-2-BUTYLENE 1027 CYCLOPROPANE 1030 1,1-DIFLUOROETHANE (REFRIGERANT GAS R 152a) 1032 DIMETHYLAMINE, ANHYDROUS 1033 DIMETHYL ETHER 1035 ETHANE 1036 ETHYLAMINE 1037 ETHYL CHLORIDE 1039 ETHYL METHYL ETHER

2201
(cont'd)

Item and group	Identification number, name and description
2°F (cont'd)	1041 ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE, with more than 9 % ethylene oxide but not more than 87 % 1055 ISOBUTYLENE 1060 METHYLACETYLENE AND PROPADIENE MIXTURE, STABILIZED such as mixtures of methylacetylene and propadiene with hydrocarbons, which as: MIXTURE P1, contain not more than 63 % methylacetylene and propadiene by volume and not more than 24 % propane and propylene by volume, the percentage of C₄-saturated hydrocarbons being not less than 14 % by volume; and as MIXTURE P2, contain not more than 48 % methylacetylene and propadiene by volume and not more than 50 % propane and propylene by volume, the percentage of C₄-saturated hydrocarbons being not less than 5 % by volume, as well as mixtures of propadiene with 1 to 4 % methylacetylene 1061 METHYLAMINE, ANHYDROUS 1063 METHYL CHLORIDE (REFRIGERANT GAS R 40) 1077 PROPYLENE 1081 TETRAFLUOROETHYLENE, INHIBITED 1083 TRIMETHYLAMINE, ANHYDROUS 1085 VINYL BROMIDE, INHIBITED 1086 VINYL CHLORIDE, INHIBITED or VINYL CHLORIDE, STABILIZED 1087 VINYL METHYL ETHER, INHIBITED 1860 VINYL FLUORIDE, INHIBITED 1912 METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE <i>Note:</i> When this mixture is non-flammable, it shall be classified under 2°A, identification number 3163. 1959 1,1-DIFLUOROETHYLENE (REFRIGERANT GAS R 1132a) 1969 ISOBUTANE 1978 PROPANE 2035 1,1,1-TRIFLUOROETHANE (REFRIGERANT GAS R 143a) 2044 2,2-DIMETHYLPROPANE 2200 PROPADIENE, INHIBITED 2419 BROMOTRIFLUOROETHYLENE 2452 ETHYLACETYLENE, INHIBITED 2453 ETHYL FLUORIDE (REFRIGERANT GAS R 161) 2454 METHYL FLUORIDE (REFRIGERANT GAS R 41) 2517 1-CHLORO-1,1-DIFLUOROETHANE (REFRIGERANT GAS R 142b) 2601 CYCLOBUTANE 3153 PERFLUORO(METHYL VINYL ETHER) 3154 PERFLUORO(ETHYL VINYL ETHER) 3252 DIFLUOROMETHANE (REFRIGERANT GAS R32) 1965 HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. such as mixtures, which as: MIXTURE A, have a vapour pressure at 70 °C not exceeding 1,1 MPa (11 bar) and a density at 50 °C not lower than 0,525 kg/l; MIXTURE A0, have a vapour pressure at 70 °C not exceeding 1,6 MPa (16 bar) and a density at 50 °C not lower than 0,495 kg/l; MIXTURE A1, have a vapour pressure at 70 °C not exceeding 2,1 MPa (21 bar) and a density at 50 °C not lower than 0,485 kg/l; MIXTURE B, have a vapour pressure at 70 °C not exceeding 2,6 MPa (26 bar) and a density at 50 °C not lower than 0,450 kg/l; MIXTURE C, have a vapour pressure at 70 °C not exceeding 3,1 MPa (31 bar) and a relative density at 50 °C not lower than 0,440 kg/l. <i>Note:</i> 1. In the case of the foregoing mixtures, the use of the following names customary in the trade is permitted for describing these substances: for mixture A and A0 BUTANE, for mixture C PROPANE. 2. 1075 PETROLEUM GASES, LIQUEFIED may be used as an alternative entry for 1965 HYDROCARBON GAS MIXTURE LIQUEFIED, N.O.S. for carriage prior to or following maritime or air carriage. 3161 LIQUEFIED GAS, FLAMMABLE, N.O.S.
2°T	Toxic gases 1062 METHYL BROMIDE 1581 CHLOROPICRIN AND METHYL BROMIDE MIXTURE 1582 CHLOROPICRIN AND METHYL CHLORIDE MIXTURE

2201
(cont'd)

Item and group	Identification number, name and description	
2°T (cont'd)	2191	SULPHURYL FLUORIDE
	1967	INSECTICIDE GAS, TOXIC, N.O.S.
	3162	LIQUEFIED GAS, TOXIC, N.O.S.
2°TF	Toxic, flammable gases	
	1026	CYANOGEN
	1040	ETHYLENE OXIDE, or ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1 MPa (10 bar) at 50 °C
	1053	HYDROGEN SULPHIDE
	1064	METHYL MERCAPTAN
	1082	TRIFLUOROCHLOROETHYLENE, INHIBITED
	2188	ARSINE
	2192	GERMANE
	2199	PHOSPHINE
	2202	HYDROGEN SELENIDE, ANHYDROUS
	2204	CARBONYL SULPHIDE
	2676	STIBINE
	3300	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 87 % ethylene oxide
	3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.

Note: 2192 GERMANE and 2199 PHOSPHINE are considered to be spontaneously flammable (pyrophoric).

2°TC	Toxic, corrosive gases	
	1005	AMMONIA, ANHYDROUS
	1017	CHLORINE
	1048	HYDROGEN BROMIDE, ANHYDROUS
	1050	HYDROGEN CHLORIDE, ANHYDROUS
	1069	NITROSYL CHLORIDE
	1076	PHOSGENE
	1079	SULPHUR DIOXIDE
	1589	CYANOGEN CHLORIDE, INHIBITED
	1741	BORON TRICHLORIDE
	2194	SELENIUM HEXAFLUORIDE
	2195	TELLURIUM HEXAFLUORIDE
	2196	TUNGSTEN HEXAFLUORIDE
	2197	HYDROGEN IODIDE, ANHYDROUS
	2418	SULPHUR TETRAFLUORIDE
	2420	HEXAFLUOROACETONE
	3057	TRIFLUOROACETYL CHLORIDE
	3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.
2°TO	Toxic, oxidizing gases	
	3083	PERCHLORYL FLUORIDE
	3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.
2°TFC	Toxic, flammable, corrosive gases	
	2189	DICHLOROSILANE
	2534	METHYLCHLOROSILANE
	3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.
2°TOC	Toxic, oxidizing, corrosive gases	
	1067	DINITROGEN TETROXIDE (NITROGEN DIOXIDE)
	1749	CHLORINE TRIFLUORIDE
	1975	NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURE (NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURE)
	2548	CHLORINE PENTAFLUORIDE
	2901	BROMINE CHLORIDE
	3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.

Note: 2421 NITROGEN TRIOXIDE is not to be accepted for carriage.

2201 **3° Refrigerated liquefied gases: gases which when carried are partially liquid because of their low**
 (cont'd) **temperature**

Note: Refrigerated gases, which cannot be classified under an identification number of this item shall not be accepted for carriage.

Item and group	Identification number, name and description
3°A	Asphyxiant gases 1913 NEON, REFRIGERATED LIQUID 1951 ARGON, REFRIGERATED LIQUID 1963 HELIUM, REFRIGERATED LIQUID 1970 KRYPTON, REFRIGERATED LIQUID 1977 NITROGEN, REFRIGERATED LIQUID 2187 CARBON DIOXIDE, REFRIGERATED LIQUID 2591 XENON, REFRIGERATED LIQUID 3136 TRIFLUOROMETHANE, REFRIGERATED LIQUID 3158 GAS, REFRIGERATED LIQUID, N.O.S.
3°O	Oxidizing gases 1003 AIR, REFRIGERATED LIQUID 1073 OXYGEN, REFRIGERATED LIQUID 2201 NITROUS OXIDE, REFRIGERATED LIQUID 3311 GAS, REFRIGERATED LIQUID, OXIDIZING, N.O.S.
3°F	Flammable gases 1038 ETHYLENE, REFRIGERATED LIQUID 1961 ETHANE, REFRIGERATED LIQUID 1966 HYDROGEN, REFRIGERATED LIQUID 1972 METHANE, REFRIGERATED LIQUID or NATURAL GAS, REFRIGERATED LIQUID, with high methane content 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 3312 GAS, REFRIGERATED LIQUID, FLAMMABLE, N.O.S.
3°TC	Toxic, corrosive gases

Note: 2186 HYDROGEN CHLORIDE, REFRIGERATED LIQUID is not to be accepted for carriage.

4° Gases dissolved under pressure: gases which when carried are dissolved in a solvent

Note: Gases dissolved under pressure, which cannot be classified under an identification number of this item shall not be accepted for carriage.

Item and group	Identification number, name and description
4°A	Asphyxiant gases 2073 AMMONIA SOLUTION, density less than 0,880 kg/l at 15 °C in water, with more than 35 % but not more than 50 % ammonia
4°F	Flammable gases 1001 ACETYLENE, DISSOLVED
4°TC	Toxic, corrosive 3318 AMMONIA SOLUTION, density less than 0,880 kg/l at 15 °C in water, with more than 50 % ammonia

Note: 2672 Ammonia solution containing not less than 10 % but not more than 35 % ammonia is a substance of Class 8 [see marginal 2801, 43°(c)].

2201 *5° Aerosol dispensers and receptacles, small, containing gas (gas cartridges)*
(cont'd) (see also marginal 2201a).

- Note:* 1. Aerosols, i.e. aerosol dispensers, are any non-refillable receptacles containing, under pressure, a gas or a mixture of gases listed in marginal 2207 (3), 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.
2. Receptacles, small, containing gas (gas cartridges) are any non-refillable receptacles containing, under pressure, a gas or a mixture of gases listed in marginal 2207 (3) and (4). They may be fitted with a valve.
3. Aerosols and receptacles, small, containing gas shall be assigned, according to the hazard of the content to the letters A to TOC. The content is considered to be flammable if the contents includes more than 45 % by mass, or more than 250 g, of flammable components. Flammable components are gases which are flammable in air at normal pressure or substances or preparations in liquid form which have a flashpoint less than or equal to 100 °C.

Item and group	Identification number, name and description
5°A	Asphyxiant gases 1950 AEROSOLS 2037 RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES), without a release device, non-refillable
5°O	Oxidizing gases 1950 AEROSOLS 2037 RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES), without a release device, non-refillable
5°F	Flammable gases 1950 AEROSOLS 2037 RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES), without a release device, non-refillable
5°T	Toxic gases 1950 AEROSOLS 2037 RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES), without a release device, non-refillable
5°TF	Toxic, flammable gases 1950 AEROSOLS 2037 RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES), without a release device, non-refillable
5°TC	Toxic, corrosive gases 1950 AEROSOLS 2037 RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES), without a release device, non-refillable
5°TO	Toxic, oxidizing gases 1950 AEROSOLS 2037 RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES), without a release device, non-refillable
5°TFC	Toxic, flammable, corrosive gases 1950 AEROSOLS 2037 RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES), without a release device, non-refillable
5°TOC	Toxic, oxidizing, corrosive gases 1950 AEROSOLS 2037 RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES), without a release device, non-refillable

2201
(cont'd)

6° Other articles containing gas under pressure

Item and group	Identification number, name and description
6°A	Asphyxiant gases 1044 FIRE EXTINGUISHERS with compressed or liquefied gas 2857 REFRIGERATING MACHINES, containing non-flammable, non-toxic, liquefied gas or ammonia solutions (identification number 2672) 3164 ARTICLES, PRESSURIZED, PNEUMATIC (containing non-flammable gas) or 3164 ARTICLES, PRESSURIZED, HYDRAULIC (containing non-flammable gas)
6°F	Flammable gases 1057 LIGHTERS or LIGHTER REFILLS (cigarettes), containing flammable gas 3150 DEVICES, SMALL, HYDROCARBON GAS POWERED or 3150 HYDROCARBON GAS REFILLS FOR SMALL DEVICES, with release device

7° Non-pressurized gases subject to special requirements (gas-samples)

Item and group	Identification number, name and description
7°F	Flammable gases 3167 GAS SAMPLE, NON-PRESSURIZED, FLAMMABLE, N.O.S., not refrigerated liquid
7°T	Toxic gases 3169 GAS SAMPLE, NON-PRESSURIZED, TOXIC, N.O.S., not refrigerated liquid
7°TF	Toxic, flammable gases 3168 GAS SAMPLE, NON-PRESSURIZED, TOXIC, FLAMMABLE, N.O.S., not refrigerated liquid

8° Empty receptacles and empty tanks

Item and group	Identification number, name and description
8°	EMPTY RECEPTACLES according to marginal 2211, EMPTY TANK-VEHICLES including EMPTY BATTERY VEHICLES, EMPTY DEMOUNTABLE TANKS, EMPTY TANK-CONTAINERS, uncleaned having contained substances of Class 2.

Note: 1. Receptacles and tanks which after having been emptied of substances of this Class still contain small residual amounts are regarded as empty receptacles or empty tanks, uncleaned.

2. Empty receptacles, uncleaned, which have contained substances of this Class are not subject to the requirements of this Directive if adequate measures have been taken to nullify any hazards. Hazards are nullified if measures have been taken to eliminate the hazards of classes 1 to 9.

2201a

(1) Gases contained in the tanks of vehicles, carrying out a transport operation subject to the provisions of this Directive, which are used for their propulsion or for the operation of their specialized equipment (e.g. refrigerating equipment) are not subject to the requirements relating to this Class set out in this Annex and in Annex B.

2201a (2) Gases and articles handed over for carriage in conformity with the following provisions are not subject to the requirements or provisions relating to this Class set out elsewhere in this Annex or in Annex B:

- (a) Gases of 1^oA, 1^oO, 2^oA and 2^oO the pressure of which in the receptacle or tank, referred to a temperature of 15 °C, does not exceed 200 kPa (2 bar) and which are completely in the gaseous state during carriage; this includes every kind of receptacle or tank, e.g. also parts of machinery and apparatus;
- (b) 1013 carbon dioxide of 2^oA or 1070 nitrous oxide of 2^oO, in the gaseous state containing not more than 0,5 % air, in metal capsules (sodors, sparklets) of marginal 2205, with not more than 25 g carbon dioxide or 25 g nitrous oxide and, per cm³ of capacity, not more than 0,75 g carbon dioxide or nitrous oxide;
- (c) Gases contained in the fuel tanks of vehicles transported; the fuel cock between gas tank and engine shall be closed and the electric contact open;
- (d) Gases contained in the equipment used for the operation of the vehicles (e.g. fire extinguishers or inflated pneumatic tyres, even as spare parts or as a load);
- (e) Gases contained in the special equipment of vehicles and necessary for the operation of this special equipment during transport (cooling systems, fish-tanks, heaters, etc.) as well s spare receptacles for such equipment or uncleaned empty exchange receptacles, transported in the same transport unit;
- (f) Uncleaned empty fixed pressure tanks which are carried on condition that they are hermetically closed.
- (g) Articles of 5^oA, 5^oO and 5^oF of a capacity not exceeding 50 cm³;
- (h) 2857 Refrigerating machines of 6^oA, containing less than 12 kg gas of 2^oA or 2073 ammonia solutions of 4^oA, and similar appliances containing less than 12 kg gas of 2^oF; these machines shall be so protected and stowed as to prevent a damage to the refrigerating system;
- (i) Gases of 3^oA, intended for the cooling of e.g. medical or biological specimens, if contained in double wall receptacles, which comply with the provisions of marginal 2206 (2)(a);
- (j) The following articles of 6^oA, manufactured and filled according to the regulations of the manufacturing State, packaged in strong outer packaging:
 - 1044 Fire extinguishers provided with protection against inadvertent discharge;
 - 3164 Articles, pressurized pneumatic or hydraulic, designed to withstand stresses greater than the internal gas pressure by virtue of transmission of force, intrinsic strength or construction;
- (k) Gases contained in foodstuffs or beverages.

(3) Gases and articles listed below, other than those provided for in (1) and (2), packed in limited quantities and carried in accordance with the following provisions are subject neither to the other provisions of this Class contained in this Annex nor to those contained in Annex B:

- (a) Gases of 1^oA, 2^oA, 3^oA and 4^oA in receptacles conforming to marginal 2202 with a maximum capacity of 120 ml;
- (b) Articles of 5^oT, 5^oTF, 5^oTC, 5^oTO, 5^oTFC and 5^oTOC with a maximum capacity of 120 ml, conforming to marginal 2202;
- (c) Articles of 5^oA, 5^oO and 5^oF with a maximum capacity of 1 000 ml which meet the conditions of marginals 2202, 2207 and 2208.

These shall be packed:

- (i) in external packagings which at least meet the conditions of marginal 3538. The total gross mass of the package shall not exceed 30 kg; or
- (ii) in shrink wrapped or stretch wrapped trays. The total gross mass of the package shall not exceed 20 kg.

2201a
(cont'd)

The 'General conditions of packing' of marginal 3500(1), (2) and (5) to (7) shall be observed.

The description of the goods in the transport document shall conform to the requirements of marginal 2226 and include the words 'limited quantity'.

Each package shall be clearly and durably marked with the identification number of the goods shown on the transport document, preceded by the letters 'UN'.

2. Provisions

A. Packages

1. General conditions of packing

2202

(1) The materials of which the receptacles and their closures are made and all substances that might come in contact with the contents shall not be liable to attack by the contents or form harmful or dangerous compounds therewith.

(2) Packagings, including their closures shall be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. When outer packagings are prescribed, the receptacles shall be firmly secured therein. Unless otherwise specified in the section entitled 'Special conditions for packaging of certain substances or articles', inner packagings may be enclosed in outer packagings either singly or in groups.

(3) Receptacles shall contain only the gas or gases for which the receptacle has been approved.

(4) Receptacles shall be constructed to withstand the potential pressure developed by the substance due to temperature changes during normal carriage.

(5) Articles of 5° and 6° and receptacles intended for the carriage of gases of 1°, 2°, and 4° and 7°, shall be so closed and leakproof as to prevent escape of the gases.

Note: 1. Special conditions of packing for each gas are listed in marginal 2250.

2. For the carriage of substances of Class 2 in tank-vehicles, demountable tanks, tank containers, see Annex B.

2. Special conditions of packing

a. Nature of receptacles

2203

(1) The following materials may be used:

(a) carbon steel for the gases of 1°, 2°, 3°, 4° and articles of 5°;

(b) alloy steel (special steels), nickel, nickel alloy (such as monel) for the gases of 1°, 2°, 3°, 4° and articles of 5°;

c) copper for the:

(i) gases of 1°A, 1°O, 1°F and 1°TF, whose filling pressure referred to a temperature of 15°C does not exceed 2 MPa (20 bar);

(ii) gases of 2°A; and also 1079 sulphur dioxide of 2°TC, 1033 dimethyl ether of 2°F; 1037 ethyl chloride of 2°F; 1063 methyl chloride of 2°F; 1086 vinyl chloride of 2°F; 1085 vinyl bromide of 2°F; and ethylene oxide carbon dioxide mixture with more than 87 % 3300 ethylene oxide of 2°TF;

(iii) gases of 3°A, 3°O and 3°F;

- 2203
(cont'd)
- (d) aluminium alloy: see table in marginal 2250;
 - (e) composite material for gases of 1°₂, 2°₂, 3°₂, 4°₂ and articles of 5°₂;
 - (f) synthetic materials for gases of 3°₂ and articles of 5°₂;
 - (g) glass for the gases of 3°₂A other than 2187 carbon dioxide or mixtures thereof, and gases of 3°₂O.
- (2) The requirements of this marginal are deemed to be met if the following standards are complied with: [reserved].
- 2204
- (1) Receptacles for 1001 dissolved acetylene of 4°₂F shall be filled entirely with a porous material, uniformly distributed, of a type approved by the competent authority and which:
- (a) does not attack the receptacles or form harmful or dangerous compounds either with acetylene or with the solvent;
 - (b) is capable of preventing the spread of decomposition of the acetylene in the mass.
- (2) The solvent shall not attack the receptacles.
- (3) The requirements of this marginal are deemed to be met if the following standards are complied with: [reserved].
- 2205
- (1) Metal capsules may be used to contain the following gases, on condition that the mass of the liquid per litre of capacity does not exceed either the maximum mass of contents indicated in marginal 2250 or 150 g per capsule:
- (a) gases of 2°₂A;
 - (b) gases of 2°₂F other than methylsilane or mixtures thereof, assigned to identification number 3161;
 - (c) gases of 2°₂TF other than 2188 arsine, 2202 hydrogen selenide and mixtures thereof;
 - (d) gases of 2°₂TC other than 1589 cyanogen chloride or mixtures thereof;
 - (e) gases of 2°₂TFC other than 2189 dichlorosilane, dimethylsilane, trimethylsilane or mixtures thereof, assigned to identification number 3309.
- (2) The capsules shall be free from faults liable to impair their strength.
- (3) 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 system during carriage.
- (4) The capsules shall be placed in an outer packaging of sufficient strength. A package shall not weigh more than 75 kg.
- 2206
- (1) Gases of 3°₂ shall be enclosed in closed receptacles of metal or synthetic or composite material which are so insulated that they cannot become coated with dew or hoar-frost. The receptacles shall be fitted with safety valves.
- (2) Gases of 3°₂A other than 2187 carbon dioxide and mixtures thereof and gases of 3°₂O may also be enclosed in receptacles which are not closed but equipped with devices which prevent the liquid from splashing out and which are:
- (a) double-walled vacuum-jacketed glass receptacles surrounded by an absorbent insulating material; these receptacles shall be protected by iron-wire baskets and placed in metal cases; or
 - (b) receptacles of metal, synthetic or composite material protected against heat transmission in such a way that they cannot become coated with dew or hoar-frost.

2206
(cont'd)

(3) The metal cases referred to in subparagraph (2)(a) and the receptacles referred to in paragraph (2)(b) shall be fitted with means of handling. The openings of the receptacles referred to in paragraph (2) shall be fitted with devices allowing gases to escape, preventing any splashing out of the liquid, and so fixed that they cannot fall out. In the case of 1073 oxygen, refrigerated liquid of 3°O and mixtures thereof, the devices referred to above and the absorbent insulating material surrounding the receptacles referred to in subparagraph (2)(a) shall be made of incombustible materials.

(4) In the case of receptacles intended for the carriage of gases of 3°O, the substances used to ensure the leakproofness of the joints or for the maintenance of the closures shall be compatible with the contents.

2207

(1) Aerosol dispensers (1950 aerosols) and 2937 receptacles, small, containing gas (gas cartridges) of 5° shall satisfy the following requirements:

(a) aerosol dispensers (1950 aerosols) containing only a gas or a mixture of gases, and 2037 gas cartridges, shall be made of metal. This requirement shall not apply to receptacles of 5° with a maximum capacity of 100 ml for 1011 butane of 2°F. Other aerosol dispensers (1950 aerosols) shall be made of metal, synthetic material or glass. Receptacles made of metal and having an outside diameter of not less than 40 mm shall have a concave bottom;

b) receptacles made of materials liable to shatter, such as glass or certain synthetic materials, shall be enclosed in a device (close-mesh wire netting, flexible cover made of synthetic material, etc.) affording protection against fragments and their dispersal. Receptacles whose capacity does not exceed 150 ml and whose internal pressure at 20 °C is below 150 kPa (1,5 bar) are exempted from this requirement;

c) the capacity of receptacles made of metal shall not exceed 1 000 ml ; that of receptacles made of synthetic material or of glass shall not exceed 500 ml;

d) each model of receptacle shall, before being put into service, satisfy a hydraulic pressure test carried out in conformity with Appendix A.2, marginal 3291. The internal pressure to be applied (test pressure) shall be 1,5 times the internal pressure at 50 °C, with a minimum pressure of 1 MPa (10 bar);

e) the release valves and dispersal devices of aerosol dispensers (1950 aerosols) and the valves of 2037 gas cartridges shall ensure that the receptacles are so closed as to be leakproof and shall be protected against accidental opening. Valves and dispersal devices which close only by the action of the internal pressure are not to be accepted.

(2) The requirements of paragraph (1) are deemed to be met if the following standards are complied with:

for aerosol dispensers (1950 aerosols) of 5°:

Annex to the Council Directive 75/324/EEC⁽¹⁾ as amended by Commission Directive 94/1/EC⁽²⁾.

for 2037 gas cartridges of 5°F containing 1965 hydrocarbon gas mixtures, liquefied:

standard EN 417: 1992.

(3) The following gases shall be accepted as propellants, as constituents of propellants, or as filler gases, for aerosol dispensers (1950 aerosols): gases of 1°A and 1°F other than 2203 silane; gases of 2°A and 2°F, other than methylsilane assigned to identification number 3161; and 1070 nitrous oxide of 2°O.

(1) Council Directive 75/324/EEC of 20 May 1975 on the approximation of the laws of the Member States relating to aerosol dispensers, published in the Official Journal of the European Communities L 147 of 9. 6. 1975.

(2) Commission Directive 94/1/EC of 6 January 1994, adapting some technicalities of Council Directive 75/324/EEC on the approximation of the laws of the relating Member States to aerosol dispensers, published in the Official Journal of the European Communities L 23 of 28. 1. 1994.

- 2207 (4) All the gases listed under (3) and, in addition, the following gases shall be accepted as filling gases for 2037 gas cartridges;
(*cont'd*)
- 1062 methyl bromide of 2°T;
 - 1040 ethylene oxide, 1064 methyl mercaptan, 3300 ethylene oxide and carbon dioxide mixture with more than 87 % ethylene oxide of 2°TF.
- 2208 (1) The internal pressure at 50 °C of articles of 5° shall exceed neither two-thirds of the test pressure of the article nor 1,32 MPa (13,2 bar).
- (2) Articles of 5° shall be so filled that at 50 °C the liquid phase does not exceed 95 % of their capacity. The capacity of aerosol dispensers (1950 aerosols) is the available volume in a closed dispenser fitted with the valve support, the valve and the dip tube.
- (3) Articles of 5° shall satisfy a tightness (leakproofness) test in conformity with Appendix A2, marginal 3292.
- 2209 (1) Articles of 5°, shall be placed in wooden cases or strong fibreboard or metal boxes; aerosol dispensers (1950 aerosols) made of glass or synthetic material and liable to shatter shall be separated from one another by interposed sheets of fibreboard or of another suitable material.
- (2) A package shall not weigh more than 50 kg if fibreboard boxes are used or more than 75 kg if other packings are used.
- (3) In the case of carriage by full load, metal articles of 5° may also be packed as follows: the articles shall be grouped together in units on trays and held in position with an appropriate plastic cover; these units shall be stacked and suitably secured on pallets.
- 2210 (1) The following requirements apply articles of 6°F:
- (a) 1057 lighters and 1057 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 the liquefied petroleum gas at 55 °C. The valve mechanisms and ignition devices shall be securely sealed, taped or otherwise fastened or designed to prevent operation or leakage of the contents during carriage. The lighters or lighter refills shall be tightly packed to prevent inadvertent operation of the release devices.
- Lighters shall contain not more than 10 g of liquefied petroleum gas. Lighters refills shall contain not more than 65 g of liquefied petroleum gas.
- The lighters and lighter refills shall be packed in the following outer packagings: natural wood boxes conforming to marginal 3527, plywood boxes conforming to marginal 3528 or reconstituted wood boxes conforming to marginal 3529 with a maximum gross mass of 75 kg, or fibreboard boxes conforming to marginal 3530 with a maximum gross mass of 40 kg. The packagings shall be tested and approved in accordance with Appendix A.5 for Packing Group II.
- (b) 3150 devices, small, hydrocarbon gas powered and 3150 hydrocarbon gas refills for small devices shall comply with the provisions of the country in which they were filled. The devices and refills shall be packed in outer packagings conforming to marginal 3538(b) tested and approved in accordance with Appendix A.5 for Packing Group II.
- (2) Gases of 7° 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).
- The gases shall be contained in hermetically sealed glass or metal inner packagings with a maximum net quantity per package of 5 litres for gases of 7°F and 1 litre for gases of 7°T and 7°TF.

2210 The outer packagings shall meet the requirements for combination packagings in accordance with
(cont'd) marginal 3538(b) and shall be tested and approved in accordance with Appendix A.5 for Packing Group III.

b. *Conditions governing receptacles*

Note: These conditions are not applicable to the metal capsules referred to in marginal 2205, to the receptacles referred to in marginal 2206 (2), the aerosol dispensers (1950 aerosols) or 2037 gas cartridges referred to in marginal 2207 or to articles of 6°F and receptacles for gases of 7° of marginal 2210.

1. Construction and fittings

2211 A distinction is made between the following types of receptacles:

- (1) Cylinders; these are transportable pressure receptacles of a capacity not exceeding 150 litres;
- (2) Tubes; these are seamless transportable pressure receptacles of a capacity exceeding 150 litres and of not more than 5 000 litres;
- (3) Pressure drums; these are welded transportable pressure receptacles of a capacity exceeding 150 litres and of not more than 1 000 litres, (e.g. cylindrical receptacles equipped with rolling hoops, receptacles on skids and receptacles in frames);
- (4) Cryogenic receptacles; these are transportable thermally insulated pressure receptacles for deeply refrigerated liquefied gases of a capacity of not more than 1 000 litres.
- (5) Bundles of cylinders (also known as frames); these are transportable assemblies of cylinders which are interconnected by a manifold and held firmly together.

Note: For limitations in capacity and use of the different types of receptacles, see the table in marginal 2250.

2212 (1) Receptacles and their closures shall be designed, calculated, manufactured, tested and equipped in such a way as to withstand all conditions to which they will be subjected during their normal use and during normal transport conditions.

In the design of pressure receptacles, all relevant factors are to be taken into account such as:

- internal pressure;
- ambient and operational temperatures including during transport;
- dynamic loads.

Normally the wall thickness shall be determined by calculation, accompanied, if needed, by experimental stress analysis. The wall thickness may be determined by experimental means.

Appropriate design calculations for the shell and supporting components shall be used to ensure the safety of the receptacles concerned.

The minimum wall thickness to withstand pressure shall be calculated with regard in particular to:

- the calculation pressures which shall not be less than the test pressure;
- the calculation temperatures allowing for appropriate safety margins;
- the maximum stresses and peak stresses concentrations where necessary;
- appropriate joint factors to the material properties.

Material characteristics to be considered are, when applicable for example:

- yield stress;
- tensile strength;
- time-dependent strength;

- 2212
(cont'd)
- fatigue data;
 - Young's modulus (modulus of elasticity);
 - appropriate amount of plastic strain;
 - impact strength;
 - fracture toughness.

The requirements of this paragraph are considered to have been complied with if the following standards, as relevant, are applied:

- for seamless steel cylinders: Annex I, Parts 1 to 3 to the Council Directive 84/525/EEC⁽¹⁾
- for welded steel cylinders: Annex I, Parts 1 to 3 to the Council Directive 84/527/EEC⁽²⁾
- for seamless aluminium cylinders: Annex I, Parts 1 to 3 to the Council Directive 84/526/EEC⁽³⁾

(2) Receptacles not designed and constructed according to standards listed in paragraph (1) shall be designed and constructed in accordance with the provisions of a technical code recognized by the competent authority. The following minimum requirements however shall be met:

- (a) For metal receptacles referred to in marginal 2211(1),(2),(3) and (5), at the test pressure the stress in the metal at the most severely stressed point of the receptacle shall not exceed 77 % of the guaranteed minimum yield stress (R_e).

By 'yield stress' is meant the stress at which a permanent elongation of 2 per thousand (i.e. 0.2 %) or, for austenitic steels, 1 % of the gauge length on the test-piece, has been produced.

Note: In the case of sheet-metal the axis of the tensile test-piece shall be at right angles to the direction of rolling. The permanent elongation at fracture, ($l = 5d$) shall be measured on a test-piece of circular cross-section in which the gauge length l is equal to five times the diameter d ; if test pieces of rectangular cross-section are used, the gauge length l shall be calculated by the formula:

$$l = 5,65 \sqrt{F_0}$$

where F_0 indicates the initial cross-sectional area of the test-piece.

Receptacles and their closures shall be made of suitable materials which shall be resistant to brittle fracture and to stress corrosion cracking between -20°C and $+50^\circ\text{C}$.

For welded receptacles only materials of faultless weldability whose adequate impact strength at an ambient temperature of -20°C can be guaranteed, particularly in the weld seams and the zones adjacent thereto, shall be used.

Welds shall be skilfully made and shall afford the fullest safety.

Any additional thickness to allow for corrosion shall not be taken into consideration in calculating the thickness of the walls.

- (b) For composite receptacles referred to in marginal 2211(1),(2),(3) and (5) which make use of composite materials i.e. comprising a liner hoop wrapped or fully wrapped with reinforcement material, the construction shall be such that a minimum burst ratio (burst pressure divided by test pressure) is

1,67 for hoop wrapped receptacles,

2,00 for fully wrapped receptacles.

⁽¹⁾ Council directive 84/525/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to seamless, steel gas cylinders, published in the Official Journal of the European Communities L 300 of 19. 11. 1984.

⁽²⁾ Council directive 84/527/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to welded unalloyed steel gas cylinders, published in the Official Journal of the European Communities L 300 of 19. 11. 1984.

⁽³⁾ Council directive 84/526/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to seamless, unalloyed aluminium and aluminium alloy gas cylinders, published in the Official Journal of the European Communities L 300 of 19. 11. 1984.

2212
(cont'd)

(c) The following requirements apply to the construction of receptacles of marginal 2206 (1), intended for gases of 3°:

1. The materials and the construction of metal receptacles shall conform to the requirements of Appendix A.2, marginals 3250 to 3254. All the mechanical and technological characteristics of the material used shall be established for each receptacle at the initial inspection; with regard to the impact strength and the bending coefficient, see Appendix A.2, marginals 3265 to 3285;
2. If other materials are used, they shall resist brittle fracture at the lowest working temperature of the receptacle and its fittings;
3. Receptacles shall be fitted with a safety valve which shall be capable of opening at the working pressure shown on the receptacle. The valves shall be so constructed as to work perfectly even at their lowest working temperature. Their reliability of functioning at that temperature shall be established and checked by testing each valve or a sample of valves of the same type of construction;
4. The vents and safety valves of receptacles shall be so designed as to prevent the liquid from splashing out;
5. Receptacles whose filling is measured by volume shall be provided by a level indicator;
6. The receptacles shall be thermally insulated. The thermal insulation shall be protected against impact by means of continuous sheathing. If the space between the receptacle and the sheathing is airless (vacuum-insulation), the protective sheathing shall be designed to withstand without deformation an external pressure of at least 100 kPa (1 bar). If the sheathing is so closed as to be gastight (e.g. in the case of vacuum-insulation), a device shall be provided to prevent any dangerous pressure from developing in the insulating layer in the event of inadequate gas-tightness of the receptacle or its fittings. The device shall prevent moisture from penetrating into the insulation.

2213

(1) Apart from a manhole which, if provided, shall be closed by an effective closure and from the necessary orifice for the removal of deposits, receptacles conforming with marginal 2211(3) shall not be equipped with more than two openings for filling and discharge respectively.

Receptacles referred to in marginal 2211 (1) and (3), intended for the carriage of gases of 2°F may be provided with other openings intended in particular for verifying the level of the liquid and the gauge pressure.

(2) Valves (cocks) shall be effectively protected from damage which could cause gas release if the receptacle falls, and during carriage and stacking. This requirement is deemed to be complied with if one or more of the following conditions are fulfilled:

- (a) Valves are placed inside the neck of the receptacle and protected by a screw-threaded plug;
- (b) Valves are protected by caps. Caps shall possess vent-holes of sufficient cross-sectional area to evacuate gases if leakage occurs at the valves;
- (c) Valves are protected by shrouds or guards;
- (d) Valves are designed and constructed in such a way that their ability to withstand damage without leakage of product has been demonstrated;
- (e) Valves are placed inside a protective frame;
- (f) Receptacles are carried in protective boxes or frames.

The requirements of this paragraph are deemed to be met if the following standards are complied with: [reserved].

(3) For receptacles the following requirements apply:

- (a) If the cylinders referred to in marginal 2211 (1) are fitted with a device to prevent rolling, this device shall not be integral with the valve cap;

- 2213** (b) Receptacles in conformity with marginal 2211 (3), which are capable of being rolled shall be equipped with rolling hoops or be otherwise protected against damage due to rolling (e.g. by corrosion-resistant metal sprayed on to the receptacle surface);

Receptacles referred to in marginal 2211 (3) and (4) which are not capable of being rolled, shall be fitted with devices (skids, rings, straps) ensuring that they can be safely handled by mechanical means and so arranged as not to impair the strength of, nor cause undue stresses in, the wall of the receptacle;

- (c) Bundles of cylinders referred to in marginal 2211 (5) shall be fitted with appropriate devices ensuring that they can be handled safely. Cylinders within the bundle and the manifold shall be suitable for the type of gas and the manifold shall have at least the same test pressure as the cylinders. The manifold and the master cock shall be situated so as to be protected against any damage.

Bundles of cylinders for the transport of certain gases subject to special requirement '1' in the table in marginal 2250 shall have on each cylinder a valve which can be independently closed, which shall be closed during transport.

- (4) (a) Receptacles, containing pyrophoric gases or very toxic gases (gases with an LC_{50} lower than 200 ppm) shall have their valve(s) openings fitted with gas-tight plugs or cap nuts which shall be made of a material not liable to attack by the contents of the receptacle.

(b) Pyrophoric gases and very toxic gases are subject to special provision 'e' in the table of marginal 2250.

(c) When these receptacles are manifolded in a bundle, each receptacle shall be fitted with a valve that shall be closed during transport.

The requirement under (a) shall apply only to the master cock.

2214 2. Testing and approval of receptacles.

- 2215** (1) The conformity of receptacles, having a test pressure capacity product of more than 300 MPa/litre (3 000 bar/litre) with the provisions of this Class, shall be assessed by one of the following methods:

- (a) Single receptacles shall be examined, tested and approved by a testing and certifying body approved by the competent authority of the country of origin, on the basis of the technical documentation and declaration of the manufacturer on compliance with the relevant provisions of this Class.

The technical documentation shall include full specifications on design and construction, and full documentation on the manufacturing and testing; or

- (b) The construction of the receptacles shall be tested and approved by a testing and certifying body approved by the competent authority of the country of origin on the basis of the technical documentation with regard to their compliance with the relevant provisions of this Class.

Receptacles shall furthermore be designed, manufactured and tested according to a comprehensive quality assurance programme for design, manufacture, final inspection and testing. The quality assurance programme shall guarantee the conformity of the receptacles with the relevant provisions of this Class and shall be approved and supervised by a testing and certifying body approved by the competent authority of the country of origin; or

- (c) The design type of the receptacles shall be approved by a testing and certifying body approved by the competent authority of the country of origin. Any receptacle of this design shall be manufactured and tested according to a quality assurance programme for production, final inspection and testing, which shall be approved and supervised by a testing and certifying body approved by the competent authority of the country of origin; or

2215
(cont'd)

(d) The design type of the receptacles shall be approved by a testing and certifying body approved by the competent authority of the country of origin. Any receptacle of this design shall be tested under the supervision of a testing and certifying body approved by the competent authority of the country of origin on the basis of a declaration of the manufacturer on compliance with the approved design and the relevant provisions of this Class.

(2) The conformity of receptacles having a test pressure capacity product of more than 100 MPa/litre (1 000 bar/litre) and not more than 300 MPa/litre (3 000 bar/litre) with the provisions of this Class shall be assessed by one of the methods described in (1) or by one of the following methods:

(a) The receptacles shall be designed, manufactured and tested according to a comprehensive quality assurance programme for their design, manufacture, final inspection and testing, approved and supervised by a testing and certifying body approved by the competent authority of the country of origin; or

(b) The design type of the receptacle shall be approved by a testing and certifying body approved by the competent authority of the country of origin. The compliance of any receptacle with the approved design shall be declared in writing by the manufacturer on the basis of his quality assurance programme for final inspection and testing of receptacles, approved and supervised by a testing and certifying body approved by the competent authority of the country of origin; or

(c) The design type of the receptacle shall be approved by a testing and certifying body approved by the competent authority of the country of origin. The compliance of any receptacle with the approved design shall be declared in writing by the manufacturer and all receptacles of this type shall be tested under the supervision of a testing and certifying body approved by the competent authority of the country of origin.

(3) The conformity of receptacles, having a test pressure capacity product of not more than 100 MPa/litre (1 000 bar/litre) with the provisions of this Class shall be assessed by one of the methods described in (1) or (2) or by one of the following methods:

(a) The compliance of any receptacle with a design, fully specified in technical documentation, shall be declared in writing by the manufacturer and all receptacles of this design shall be tested under the supervision of a testing and certifying body approved by the competent authority of the country of origin; or

(b) The design type of the receptacles shall be approved by a testing and certifying body approved by the competent authority of the country of origin. The compliance of all receptacles with the approved design shall be declared in writing by the manufacturer and all receptacles of this type shall be tested individually.

(4) The requirements of paragraphs (1) to (3) shall be deemed to be complied with:

(a) as regards the quality assurance systems mentioned in paragraphs (1) and (2), if they conform to the relevant European Standard of the EN ISO 9000 series;

(b) in their entirety, if the relevant conformity assessment procedures of Council Decision 93/465/EEC⁽¹⁾:

(i) for the receptacles listed under paragraph (1) the modules G, H with design test, B in combination with D and B in combination with F;

(ii) for the receptacles listed under paragraph (2) the modules H, B in combination with E and B in combination with extended module C (C1);

(iii) for the receptacles listed under paragraph (3) the modules Aa and B in combination with C;

are complied with.

⁽¹⁾ Council Decision of 22nd July 1993 concerning the modules for the various phases of the conformity assessment procedures and the rules for the affixing and use of the CE conformity marking, which are intended to be used in the technical harmonization directives. Published in the Official Journal of the European Communities L 220 of 30. 8. 1993.

2215 (5) Requirements for manufacturers

(cont'd)

The manufacturer shall be technically able and shall possess all suitable means required for the satisfactory manufacture of receptacles; this relates in particular to qualified personnel

(a) to supervise the entire manufacturing process;

(b) to carry out joining of materials;

(c) to carry out the relevant tests.

The proficiency test of a manufacturer shall in all instances be carried out by a testing and certifying body approved by the competent authority of the country of origin.

The particular certification process the manufacturer intends to apply shall be taken into consideration.

(6) Requirements for testing and certifying bodies

Testing and certifying bodies shall be independent from manufacturing enterprises and technologically competent to the degree required. These requirements shall be deemed to be met if the bodies have been approved on the basis of an accreditation procedure in accordance with the European standards series EN 45 000.

2216 (1) Receptacles shall be subjected to initial inspection in accordance with the following specifications:

On an adequate sample of receptacles:

(a) Testing of the material of construction in respect at least of yield stress, tensile strength, and permanent elongation at fracture;

(b) Measurement of wall thickness at the thinnest point, and calculation of the stress;

(c) Checking the homogeneity of the material for each manufacturing batch, and inspection of the external and internal condition of the receptacles;

For all receptacles:

(d) A hydraulic pressure test in accordance with the provisions of marginal 2219;

Note: With the agreement of the testing and certifying body approved by the competent authority, the hydraulic pressure test may be replaced by a test using a gas, where such an operation does not entail any danger.

(e) An inspection of the markings on the receptacles, see marginal 2223 (1) to (4);

(f) In addition, receptacles intended for the carriage of 1001 acetylene, dissolved, of 4°F shall have an inspection of the nature of the porous material and the quantity of solvent.

The requirements of this paragraph are deemed to be met if the following standards are complied with: [reserved].

(2) Specific provisions apply for aluminium alloy receptacles for certain gases. (see Appendix A.2).

The requirements of this paragraph are deemed to be met if the following standards are complied with:

— Annex I, Part 3, and Annex II to the Council Directive 84/526/EEC⁽¹⁾

(3) Receptacles shall withstand the test pressure without undergoing permanent deformation or exhibiting cracks.

⁽¹⁾ Council directive 84/526/EEC of 17 September 1984 on the approximation of the laws of the Member States relating to seamless, unalloyed aluminium and aluminium alloy gas cylinders, published in the Official Journal of the European Communities L 300 of 19. 11. 1984.

2217 (1) Refillable receptacles shall be subjected to periodic inspections under the supervision of a testing and certifying body approved by the competent authority, in accordance with the following specifications:

- (a) Check of the external conditions of the receptacle and verification of the equipment and the external markings;
- (b) Check of the internal conditions of the receptacle (e.g. by weighing, internal inspection, checks of wall thickness);
- (c) The hydraulic pressure test and, if necessary, verification of the characteristics of the material by suitable tests;

Note: 1. With the agreement of the testing and certifying body approved by the competent authority, the hydraulic pressure test may be replaced by a test using a gas, where such an operation does not entail any danger, or by an equivalent method based on ultrasound.

2. With the agreement of the testing and certifying body approved by the competent authority, the hydraulic pressure test of receptacles according to marginal 2211 (1) and (2) may be replaced by an equivalent method based on acoustic emission.

3. With the agreement of the competent authority, the hydraulic pressure test of each welded steel receptacle of marginal 2211 (1) intended for the carriage of gases of 2°F, identification number 1965, with a capacity below 6,5 l may be replaced by another test ensuring an equivalent level of safety.

The requirements of this paragraph are deemed to be met if the following standards are complied with: [reserved].

(2) If special requirements for certain substances do not appear in the table of marginal 2250, periodic inspections shall be carried out:

- (a) Every 3 years in the case of receptacles intended for the carriage of gases of 1° and 2° of the groups TC, TFC, TOC;
- (b) Every 5 years in the case of receptacles intended for the carriage of gases of 1° and 2° of the groups T, TF and TO and gases of 4°;
- (c) Every 10 years in the case of receptacles intended for the carriage of gases of 1°, 2° and 3° of the groups A, O and F;

By derogation from this paragraph, the periodic inspection of receptacles which make use of composite materials (composite receptacles) shall be carried out at intervals determined by the competent authority of the Member State which has approved the technical code for the design and construction.

(3) For receptacles intended for the carriage of 1001 acetylene, dissolved, of 4°F, only the external condition (corrosion, deformation), and the condition of the porous mass (loosening, settlement) shall be examined.

If a monolithic material is used as a porous mass, the interval between periodic inspections may be extended to 10 years.

The requirements of this paragraph are deemed to be met if the following standards are complied with: [reserved].

(4) By derogation from marginal 2217 (1) (c) closed receptacles conforming to marginal 2206 (1) shall be subjected to external inspection and to a leakproofness test. The leakproofness test shall be carried out with the gas contained in the receptacle or with an inert gas. Checking shall be performed by means of a pressure gauge or by vacuum measurement. The thermal insulation need not be removed.

2217 The requirements of this paragraph are deemed to be met if the following standards are complied with:
(cont'd) [reserved].

(5) The receptacles referred to in marginal 2211 may be carried after the expiry of the time-limit set for the periodic inspection prescribed for the purpose of undergoing the inspection.

2218

c. *Test pressure, degree of filling, and limitation of capacity of receptacles*

2219 The following requirements apply to receptacles referred to in marginal 2211:

- (a) The minimum test pressure required for receptacles referred to in marginal 2211 (1), (2), (3) and (5) is 1 MPa (10 bar);
- (b) For gases of 1° having a critical temperature below -50°C the internal pressure (test pressure) to be applied in the hydraulic pressure test shall be at least one and one-half times the filling pressure at 15°C ;
- (c) For gases of 1° having a critical temperature of -50°C or above and for liquefied gases of 2° having a critical temperature below 70°C , the degree of filling shall be such that the internal pressure at 65°C does not exceed the test pressure of the receptacles.

For gases and gas mixtures with insufficient data, the maximum permissible filling degree (FD) shall be determined as follows:

$$\text{FD} \leq 8,5 \times 10^{-4} \cdot d_g \cdot P_e$$

where FD = maximum permissible filling degree (in kg/l)

d_g = gas density (at 15°C , 1 bar) (in kg/m^3)

P_e = minimum test pressure (in bar)

If the density of the gas is unknown, the maximum permissible filling degree shall be determined as follows:

$$\text{FD} \leq \frac{P_e \cdot \text{MM} \cdot 10^{-3}}{R \cdot 338}$$

where FD = maximum permissible filling degree (in kg/l)

P_e = minimum test pressure (in bar)

MM = molar mass (in g/mol)

R = $8,31451 \times 10^{-2} \text{ bar}/\text{l}/\text{mol}^{-1}/\text{K}^{-1}$ (gas constant)

(For gas mixtures the average molar mass is to be taken, taking into account the concentrations of the various components);

- (d) For gases of 2° having a critical temperature of 70°C or above, the maximum permissible mass of contents per litre of capacity (filling factor) equals 0,95 times the density of the liquid phase at 50°C ; in addition, the vapour phase shall not disappear below 60°C . The test pressure will be at least equal to the vapour pressure of the liquid at 70°C , minus 100 kPa (1 bar).

For pure gases with insufficient data the maximum filling degree shall be determined as follows:

$$\text{FD} \leq (0,0032 \cdot \text{BP} - 0,24) \cdot d_l$$

where FD = maximum permissible filling degree in kg/l

BP = boiling point (in Kelvin)

d_l = density of the liquid at boiling point (in kg/l)

- 2219 (cont'd) (e) For gases of 3^oA and 3^oO the degree of filling, at the filling temperature and at a pressure of 0,1 MPa (1 bar) shall not exceed 98 % of the capacity.

For gases of 3^oF 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 would reach 95 % of the capacity at that temperature.

For receptacles according to marginal 2206 (1) the test pressure equals 1,3 times the maximum allowable working pressure, increased by 1 bar for vacuum insulated receptacles;

- (f) For 1001 acetylene, dissolved of 4^oF, once equilibrium has been achieved at 15 °C, the filling pressure shall not exceed the value prescribed by the competent authority for the porous mass, see marginal 2223 (1) (h). The quantity of solvent and the quantity of acetylene shall likewise correspond to the figures specified in the approval.

The requirements of this marginal are deemed to be met if the following standards are complied with: [reserved].

Note: The test pressure, degree of filling and limitation of capacity of receptacles of marginal 2211 for the different gases, as well as restrictions concerning toxic gases with a LC₅₀ less than 200 ppm are given in the table contained in marginal 2250.

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3. Mixed packing

- 2222 (1) Substances and articles of this Class may be packed together in an outer packaging if they do not react dangerously with each other.
- (2) Substances and articles of this Class may be packed together in the same outer packaging with substances and/or goods which are not subject to the requirements of this Directive, if they do not react dangerously with each other.
- (3) Substances and articles of this Class may be packed together in the same combination packaging according to marginal 3538 with substances and articles of other classes — provided that mixed packing is also permitted for substances and articles of those classes — if they do not react dangerously with each other.
- (4) The following are considered dangerous reactions:
- (a) combustion and/or giving off considerable heat;
 - (b) emission of flammable and/or toxic gases;
 - (c) formation of corrosive liquids;
 - (d) formation of unstable substances.
- (5) The requirements of marginals 2002 (6) and (7) and of 2202 shall be met.
- (6) A package shall not weigh more than 100 kg when wood or fibreboard boxes are used.

4. Markings and labels on packages (see Appendix A.9)

2223 **Marking**

- (1) Refillable receptacles according to marginal 2211 shall bear the following particulars in clearly legible and durable characters:
- (a) The name or the mark of the manufacturer;
 - (b) The approval number (if the design type of the receptacle is approved according to marginal 2215);

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(cont'd)

- (c) The serial number of the receptacle provided by the manufacturer;
- (d) The tare of the receptacle without fittings and accessories, when the check of wall thickness requested in marginal 2217 (1) (b) is performed by weighing ;
- (e) The test pressure (see marginal 2219);

- (f) The date (month and year) of the initial inspection and the most recent periodic inspection;

Note: The month need not be indicated for gases for which the interval between periodic inspections is 10 years or more (see marginal 2217 (2) and marginal 2250).

- (g) The stamp of the expert who carried out the tests and inspections;
- (h) In the case of 1001 acetylene, dissolved of 4°F: the permitted filling pressure [see marginal 2219 (f)] and the total of the mass of: the empty receptacle, the fittings and accessories, the porous material and the solvent;
- (i) The water capacity in litres;
- (j) For gases of 1° filled by pressure, the maximum filling pressure at 15 °C allowed for the receptacle;

These marks shall immovably be affixed, e.g. engraved, either on a reinforced part of the receptacle, on a ring, or on immovably affixed attachments.

They can also be engraved on the receptacle directly, provided it can be demonstrated that the strength of the receptacle is not impaired by the marking.

- (2) Refillable receptacles according to marginal 2211 shall in addition bear the following particulars in clearly legible and durable characters:

- (a) the identification number and the name of the gas or mixture of gases in full, as given in marginal 2201;

In the case of gases classified under an n.o.s. entry, only the identification number and the technical name⁽¹⁾ of the gas have to be indicated;

In the case of mixtures, not more than the two constituents which most predominantly contribute to the hazards have to be indicated;

- (b) For gases of 1° filled by mass and for liquefied gases, either the maximum filling mass and the tare of the receptacle with fittings and accessories as fitted at the time of filling, or the gross mass;
- (c) The date (year) of the next periodic inspection.

These marks can either be engraved or indicated on a durable information disk or label attached on the receptacle, or indicated by an adherent and clearly visible marking such as by painting or by any equivalent process.

- (3) The requirements of paragraphs (1) and (2) are deemed to be met if the following standards are complied with: [reserved].

(1) The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose. Instead of the technical name the use of one of the following names is permitted:

- For 1078 refrigerant gas, n.o.s., of 2°A: mixture F1, mixture F2, mixture F3;
- For 1060 methyl acetylene and propadiene mixtures, stabilized, of 2°F: mixture P1, mixture P2;
- For 1965 hydrocarbon gas mixture, liquefied, n.o.s., of 2°F: mixture A or butane, mixture A0 or butane, mixture A1, mixture B, mixture C or propane.

2223 (4) Non-refillable cylinders according to marginal 2211 (1) shall bear the following particulars in clearly legible and durable characters:

(cont'd)

- (a) The name or the mark of the manufacturer;
- (b) The approval number (if the design type of the receptacle is approved according to marginal 2215);
- (c) The serial or batch number of the receptacle provided by the manufacturer;
- (d) The test pressure (see marginal 2219);
- (e) The date (month and year) of manufacturing;
- (f) The stamp of the expert who carried out the initial inspection;
- (g) The identification number and the name of the gas or mixture of gases in full, as given in marginal 2201;

In case of gases classified under a n.o.s. entry, only the identification number and the technical name⁽¹⁾ of the gas have to be indicated;

In the case of mixtures, not more than the two constituents which most predominantly contribute to the hazards have to be indicated;

- (h) The words 'DO NOT REFILL'; this marking shall be a minimum of 6 mm in height.

The marks mentioned in this paragraph, other than (g), shall immovably be affixed, e.g. engraved, either on a reinforced part of the receptacle, on a ring, or on immovably affixed attachments.

They can also be engraved on the receptacle directly, provided it can be demonstrated that the strength of the receptacle is not impaired by the marking.

The requirements of this paragraph are deemed to be met if the following standards are complied with: [reserved].

- (5) Every package containing receptacles holding gases of 1° to 4°, 6°F, 7° or receptacles, small, containing gas (gas cartridges) of 5° shall be clearly marked with the identification number of the goods to be entered in the transport document, preceded by the letters 'UN', with the addition: 'Class 2'.

This requirement need not be complied with if the receptacles and their markings are clearly visible.

- (6) Packages containing aerosol dispensers of 5° shall be clearly marked as follows:

'UN 1950 AEROSOL'.

2224 Danger labels

Note: For the purpose of labelling, a package is any packaging containing receptacles, aerosol dispensers or receptacles small, containing gas (gas cartridges), or any receptacle referred to in marginal 2211 without outer packaging.

⁽¹⁾ The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose. Instead of the technical name the use of one of the following names is permitted:

- For 1078 refrigerant gas, n.o.s., of 2°A: mixture F1, mixture F2, mixture F3;
- For 1060 methyl acetylene and propadiene mixtures, stabilized, of 2°F: mixture P1, mixture P2;
- For 1965 hydrocarbon gas mixture, liquefied, n.o.s., of 2°F: mixture A or butane, mixture A0 or butane, mixture A1, mixture B, mixture C or propane.

- 2224 (1) Packages containing substances and articles of this Class shall bear the labels indicated below:
(*cont'd*)

Substances and articles assigned under the various item numbers to the following groups	Label model Nos
--	-----------------

A	2
F	3
O	2 + 05
T	6.1
TF	6.1 + 3
TC	6.1 + 8
TO	6.1 + 05
TFC	6.1 + 3 + 8
TOC	6.1 + 05 + 8

(2) Every package containing gases of 3° shall in addition bear, on two opposite sides, labels conforming to model No 11.

(3) Labels on gas cylinders of 2211 (1) may be attached to the shoulder of the cylinders and may have smaller dimensions accordingly, provided that they remain clearly visible.

2225

B. Particulars in the transport document

- 2226 (1) The description of the goods in the transport document shall conform to one of the identification numbers and one of the names printed in capital letters in marginal 2201. If the substance is not mentioned by name but is assigned to an n.o.s. entry the description of the goods shall consist of the substance identification number and the n.o.s. designation, followed by the chemical or technical name⁽¹⁾.

The description of the goods shall be followed by particulars of the class, the item number, the group, and the initials 'ADR' (or RID), e.g. '2, 2°F, ADR'.

For the carriage of mixtures [see marginal 2200 (3)] containing several components subject to the provisions of this Directive, it will not, in general, be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the mixtures.

For the carriage of mixtures [see marginal 2200 (3)] in tanks (demountable tanks, fixed tanks, tankcontainers or elements of battery-vehicles), the composition of the mixture as a percentage of the volume or as a percentage of the mass shall be given. Constituents below 1 % need not be indicated.

Instead of the technical name, the use of one of the following names is permitted:

- For 1078 refrigerant gas, n.o.s., of 2°A:
mixture F1, mixture F2, mixture F3;
- For 1060 methylacetylene and propadiene mixtures, stabilized, of 2°F:
mixture P1, mixture P2;
- For 1965 hydrocarbon gas mixture, liquefied, n.o.s., of 2°F:
mixture A or butane, mixture A0 or butane, mixture A1, mixture B, mixture C or propane.
For transport in tanks the trade names 'butane' and 'propane' may be used only as a complement;
- For the entry 1010 of 2°F:
mixtures of 1,3-butadiene and hydrocarbons, inhibited

For these mixtures the composition need not be indicated.

⁽¹⁾ The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose.

- 2226 (2) For the carriage of receptacles referred to in marginal 2211 under the conditions of marginal 2217 (5),
(cont'd) the following entry shall be included in the transport document:

'Carriage in conformity with marginal 2217 (5)'.

2227-
2236

C. Empty packagings

- 2237 (1) Uncleaned empty receptacles and tanks of 8° shall be closed in the same manner as if they were full.
- (2) Uncleaned empty receptacles and tanks of 8° shall bear the same danger labels as if they were full.
- (3) The description in the transport document shall conform to one of the names printed in capital letters in item 8°, and shall be followed by '2, 8°, ADR', e.g. 'Empty receptacle, 2, 8°, ADR'.

For empty receptacles with a capacity of more than 1 000 l, and for empty tank-vehicles (including battery-vehicles), demountable tanks and tank-containers, uncleaned, this description shall be completed by adding the words 'Last load', together with the substance identification number, the name, the item number and the group of goods last loaded e.g. 'Last load: 1017 chlorine, 2°TC'.

- (4) The receptacles of 8° referred to in marginal 2211 may be transported after the expiry of the time-limit set for the periodic inspection prescribed in marginal 2217 for the purpose of undergoing the inspection.

2238

D. Transitional provisions

- 2239 (1) Receptacles built before 1 January 1997 and not conforming to the requirements of this Annex applicable as from 1 January 1997 but the transport of which was permitted under the requirements of Annex A of this Directive applicable until 31 December 1996 may continue to be transported after that date if the periodic test requirements in marginal 2 217 are complied with.
- (2) Cylinders referred to in marginal 2211 (1) which have been submitted to an initial inspection or periodic inspection before 1 January 1997 may be transported empty uncleaned without a label until the date of the next refilling or the next periodic inspection.

2240-
2249

E. Table of gases and special provisions

- 2250 List of gases with reference to the main provisions of marginals 2211 to 2219 and to special requirements for specific substances.

List of gases: see tables

Keys for 'special requirements':

- a: Aluminium alloys not allowed in contact with gas.
- b: Valves made of copper are not accepted.
- c: Metal parts in contact with the contents shall not contain more than 70 % copper.
- d: No receptacle may contain more than 5 kg of the substance.
- e: The valve outlets shall be fitted with plugs or cap-nuts ensuring gas-tightness [see 2213(4)].

- 2250
(*cont'd*)
- f: The necessary steps to prevent dangerous reactions (e.g. polymerisation, decomposition...) during carriage shall be taken. If necessary, stabilization or addition of an inhibitor is required.
- g: The use of test pressures other than those indicated are allowed provided the prescriptions of marginal 2219(c) are followed.
- h: If a monolithic material is used as a porous mass, the interval between inspections may be extended to 10 years.
- i: Maximum filling according to the figures specified in the approval.
- j: The test pressure and degree of filling shall be calculated in accordance with the requirements of marginal 2219.
- k: The interval between tests may be extended to 10 years when receptacles are made of aluminium alloys.
- l: Each cylinder in a frame (bundle) shall be fitted with an individual valve that shall be closed during transport.
- m: The interval between inspections for steel cylinders of marginal 2211(1) may be extended to 15 years:
- (a) with the agreement of the competent authority (authorities) of the country (countries) where the periodic inspection and the carriage take place, and
 - (b) in accordance with the requirements of a technical code or a standard recognized by the competent authority, or standard EN 1440:1996 'Transportable refillable welded steel cylinders for liquefied petroleum gas (LPG) — Periodic requalification'.
- n: In the case of receptacles for the carriage of gases under a n.o.s position, the following requirements shall be taken into account as applicable:
1. The materials of which the receptacles and their closures are made shall not be liable to attack by the contents or form harmful or dangerous compounds therewith.
 2. The test pressure and degree of filling is to be calculated in accordance with the requirements of marginal 2219.
 3. Toxic gases and gas mixtures with a LC_{50} less than 200 ppm are not allowed for transport in receptacles referred to in marginal 2211 (2) and (3).
 4. The valves of receptacles for toxic gases and gas mixtures with a LC_{50} less than 200 ppm or in the case of pyrophoric gases or flammable mixtures of gases containing more than 1 % of pyrophoric compounds shall be fitted with gas tight plugs or cap-nuts. When these receptacles are manifolded in a bundle, each of them shall be fitted with an individual valve that shall be closed during transport.
 5. The necessary steps to prevent dangerous reactions (i.e. polymerisation, decomposition) during carriage shall be taken. If necessary, stabilization or addition of an inhibitor is required.
 6. Other criteria may be used for filling of welded steel cylinders referred to in marginal 2211 (1) intended for the carriage of substances of 2°F, identification number 1965:
 - (a) with the agreement of the competent authorities of the countries where the transport is carried out; and
 - (b) in compliance with the provisions of a national code or a standard recognised by the competent authorities, or standard EN 1439:1996 'Transportable refillable welded steel cylinders for liquefied Petroleum gases (LPG) — Procedures for checking before, during and after refilling.'

When the criteria for filling are different from those in marginal 2219, the transport document shall include the statement 'Transport in accordance with marginal 2250, special requirement n' and the indication of the reference temperature used for the calculation of the filling factor.

2250
(cont'd)

Item No and Group	Identi- fication No	Name of the substance or article	Packing	Test		Filling	Special re- quire- ments	
			Type of receptacle (Marginal 2211)	Pressure		Period (years) (¹)		Max. fill. degree kg/l or MPa or Vol %
				X fill. press.	MPa			
1°A	1002	AIR, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1006	ARGON, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1046	HELIUM, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1056	KRYPTON, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1065	NEON, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1066	NITROGEN, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1979	RARE GASES MIXTURE, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1980	RARE GASES AND OXYGEN MIXTURE, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1981	RARE GASES AND NITROGEN MIXTURE, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1982	TETRAFLUOROMETHANE, COMPRESSED (REFRIGERANT GAS R 14, COMPRESSED)	(1),(2),(3),(5) (1),(2),(3),(5)		20,0 30,0	10	0,62 0,94	g g
	2036	XENON, COMPRESSED	(1),(2),(3),(5)		13,0	10	1,24	g
	2193	HEXAFLUOROETHANE, COMPRESSED (REFRIGERANT GAS R 116, COMPRESSED)	(1),(2),(3),(5)		20,0	10	1,10	g
	1956	COMPRESSED GAS, N.O.S.	(1),(2),(3),(5)	1,5		10	2/3 T.P.	n
	1°O	1014	CARBON DIOXIDE AND OXYGEN MIXTURE, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.
1072		OXYGEN, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
3156		COMPRESSED GAS, OXIDIZING, N.O.S.	(1),(2),(3),(5)	1,5		10	2/3 T.P.	n
1°F		1049	HYDROGEN, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.
	1957	DEUTERIUM, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	1962	ETHYLENE, COMPRESSED	(1),(2),(3),(5) (1),(2),(3),(5)		22,5 30,5	10	0,34 0,37	g g
	1971	METHANE, COMPRESSED or NATURAL GAS, COMPRESSED with high methane content	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	2034	HYDROGEN AND METHANE MIXTURE, COMPRESSED	(1),(2),(3),(5)	1,5		10	2/3 T.P.	
	2203	SILANE, COMPRESSED (²)	(1),(2),(3),(5) (1),(2),(3),(5)		22,5 25,0	10 10	0,32 0,41	e,g,l e,g,l
	1964	HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S	(1),(2),(3),(5)	1,5		10	2/3 T.P.	n
	1954	COMPRESSED GAS, FLAMMABLE, N.O.S	(1),(2),(3),(5)	1,5		10	2/3 T.P.	n
1°T	1612	HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE	(1),(2),(3),(5)	1,5		5	2/3 T.P.	n
	1955	COMPRESSED GAS, TOXIC, N.O.S.	(1),(2),(3),(5)	1,5		5	2/3 T.P.	n
1°TF	1016	CARBON MONOXIDE, COMPRESSED	(1),(2),(3),(5)	1,5		5	2/3 T.P.	k

⁽¹⁾ Not applicable for receptacles made of composite materials [see marginal 2217(2)].⁽²⁾ Considered as pyrophoric.

2250
(cont'd)

Item No and Group	Identi- fication No	Name of the substance or article	Packing	Test			Filling	Special re- quire- ments
			Type of receptacle (Marginal 2211)	Pressure		Period (years) (¹)	Max. fill. degree kg/l or MPa or Vol %	
				X fill. press.	MPa			
1°TF (cont'd)	1023	COAL GAS, COMPRESSED	(1),(2),(3),(5)	1,5		5	2/3 T.P.	
	1071	OIL GAS, COMPRESSED	(1),(2),(3),(5)	1,5		5	2/3 T.P.	
	1911	DIBORANE, COMPRESSED	(1),(5)		25,0	5	0,072	e,f,l
	2600	CARBON MONOXIDE AND HYDROGEN MIXTURE, COMPRESSED	(1),(2),(3),(5)	1,5		5	2/3 T.P.	k
	1953	COMPRESSED GAS, TOXIC, FLAM- MABLE, N.O.S.	(1),(2),(3),(5)	1,5		5	2/3 T.P.	n
1°TC	1008	BORON TRIFLUORIDE, COMPRESSED	(1),(2),(3),(5)		22,5	3	0,715	g
			(1),(2),(3),(5)		30,0		0,86	g
	1859	SILICON TETRAFLUORIDE, COM- PRESSED	(1),(2),(3),(5) (1),(2),(3),(5)		20,0 30,0	3	0,74 1,1	g g
	2198	PHOSPHORUS PENTAFLUORIDE, COM- PRESSED	(1),(5) (1),(5) (1),(5)		20,0 30,0	3	0,9 1,34	e,g,l e,g,l
	2417	CARBONYL FLUORIDE, COMPRESSED	(1),(2),(3),(5) (1),(2),(3),(5)		20,0 30,0	3	0,47 0,7	g g
	3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.	(1),(2),(3),(5)	1,5		3	2/3 T.P.	n
1°TO	2451	NITROGEN TRIFLUORIDE	(1),(2),(3),(5) (1),(2),(3),(5)		20,0 30,0	5	0,5 0,75	g g
	3303	COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S.	(1),(2),(3),(5)	1,5		5	2/3 T.P.	n
1°TFC	3305	COMPRESSED GAS, TOXIC, FLAM- MABLE, CORROSIVE, N.O.S.	(1),(2),(3),(5)	1,5		3	2/3 T.P.	n
1°TOC	1045	FLUORINE, COMPRESSED	(1),(5)		20,0	5	2,8 MPa	a,d,e,l
	1660	NITRIC OXIDE, COMPRESSED	(1),(5)	1,5		3	2/3 T.P.	e,l
	2190	OXYGEN DIFLUORIDE	(1),(5)		20,0	3	2,8 MPa	a,d,e,l
	3306	COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	(1),(2),(3),(5)	1,5		3	2/3 T.P.	n
2°A	1009	BROMOTRIFLUOROMETHANE (REFRIGERANT GAS R 13B1)	(1),(2),(3),(5) (1),(2),(3),(5) (1),(2),(3),(5)		4,2 12,0 25,0	10 10 10	1,13 1,44 1,60	g g g
	1013	CARBON DIOXIDE	(1),(2),(3),(5) (1),(2),(3),(5)		19,0 25,0	10 10	0,66 0,75	g g
	1015	CARBON DIOXIDE AND NITROUS OXIDE MIXTURE	(1),(3),(5)		25,0	10	0,75	g
	1018	CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)	(1),(2),(3),(5)		2,9	10	1,03	
	1020	CHLOROPENTAFLUOROETHANE (REFRIGERANT GAS R 115)	(1),(2),(3),(5)		2,5	10	1,08	
	1021	1-CHLORO-1,2,2,2- TETRAFLUOROETHANE (REFRIGERANT GAS R 124)	(1),(2),(3),(5)		1,2	10	1,2	

(1) Not applicable for receptacles made of composite materials [see marginal 2217(2)].

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(cont'd)

Item No and Group	Identi- fication No	Name of the substance or article	Packing	Test		Filling	Special re- quire- ments	
			Type of receptacle (Marginal 2211)	Pressure		Period (years) (¹)		Max. fill. degree kg/l or MPa or Vol %
				X fill. press.	MPa			
2 ^o A (cont'd)	1022	CHLOROTRIFLUOROMETHANE (REFRIGERANT GAS R 13)	(1),(2),(3),(5) (1),(2),(3),(5) (1),(2),(3),(5) (1),(2),(3),(5)	1,5	10,0 12,0 19,0 25,0	10 10 10 10	0,83 0,90 1,04 1,10 g g g g	
	1028	DICHLORODIFLUOROMETHANE (REFRIGERANT GAS R 12)	(1),(2),(3),(5)		1,8	10	1,15	
	1029	DICHLOROFLUOROMETHANE (REFRIGERANT GAS R 21)	(1),(2),(3),(5)		1,0	10	1,23	
	1058	LIQUEFIED GASES, non-flammable, charged with nitrogen, carbon dioxide or air	(1),(2),(3),(5)			10	j	
	1080	SULPHUR HEXAFLUORIDE	(1),(2),(3),(5) (1),(2),(3),(5) (1),(2),(3),(5)		7,0 14,0 16,0	10 10 10	1,04 1,33 1,37 g g g	
	1858	HEXAFLUOROPROPYLENE (REFRIGE- RANT GAS R 1216)	(1),(2),(3),(5)		2,2	10	1,11	
	1952	CARBON DIOXIDE AND ETHYLENE OXIDE MIXTURE with not more than 9 % ethylene oxide	(1),(2),(3),(5) (1),(2),(3),(5)		19,0 25,0	10 10	0,66 0,75	
	1958	DICHLOROTETRAFLUOROETHANE (REFRIGERANT GAS R 114)	(1),(2),(3),(5)		1,0	10	1,30	
	1973	CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIX- TURE with fixed boiling point, with approxi- mately 49 % chlorodifluoromethane (REFRIGERANT GAS R 502)	(1),(2),(3),(5)		3,1	10	1,05	
	1974	CHLORODIFLUOROBROMOMETHANE (REFRIGERANT GAS R 12B1)	(1),(2),(3),(5)		1,0	10	1,61	
	1976	OCTAFLUOROCYCLOBUTANE (REFRIGERANT GAS RC 318)	(1),(2),(3),(5)	1,1	10	1,34		
	1983	1-CHLORO-2,2,2-TRIFLUOROETHANE (REFRIGERANT GAS R 133a)	(1),(2),(3),(5)	1,0	10	1,18		
	1984	TRIFLUOROMETHANE (REFRIGERANT GAS R 23)	(1),(2),(3),(5) (1),(2),(3),(5)	19,0 25,0	10 10	0,87 0,95 g g		
	2422	OCTAFLUOROBUT-2-ENE (REFRIGER- ANT GAS R 1318)	(1),(2),(3),(5)	1,2	10	1,34		
	2424	OCTAFLUOROPROPANE (REFRIGER- ANT GAS R 218)	(1),(2),(3),(5)	2,5	10	1,09		
	2599	CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE, AZEOTROPIC MIXTURE with approximately 60 % chloro- trifluoromethane (REFRIGERANT GAS R 503)	(1),(2),(3),(5) (1),(2),(3),(5) (1),(2),(3),(5)	3,1 4,2 10,0	10 10 10	0,11 0,20 0,66		
	2602	DICHLORODIFLUOROMETHANE AND 1,1-DIFLUOROETHANE, AZEOTROPIC MIXTURE with approximately 74 % dichlo- rodifluoromethane (REFRIGERANT GAS R 500)	(1),(2),(3),(5)	2,2	10	1,01		
	3070	ETHYLENE OXIDE AND DICHLORODI- FLUOROMETHANE MIXTURE with not more than 12,5 % ethylene oxyde	(1),(2),(3),(5)	1,8	10	1,09		
	3159	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)	(1),(2),(3),(5)	2,2	10	1,04		

(¹) Not applicable for receptacles made of composite materials [see marginal 2217(2)].

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(cont'd)

Item No and Group	Identification No	Name of the substance or article	Packing	Test		Filling	Special requirements	
			Type of receptacle (Marginal 2211)	Pressure		Period (years) ⁽¹⁾		Max. fill. degree kg/l or MPa or Vol %
				X fill. press.	MPa			
2°A (cont'd)	3220	PENTAFLUOROETHANE (REFRIGERANT GAS R 125)	(1),(2),(3),(5)		4,9	10	0,95	g
	3296	HEPTAFLUOROPROPANE (REFRIGERANT GAS R 227)	(1),(2),(3),(5)		1,5	10	1,2	
	3297	ETHYLENE OXIDE AND CHLOROTETRAFLUOROETHANE MIXTURE, with not more than 8,8 % ethylene oxide	(1),(2),(3),(5)		1,0	10	1,16	
	3298	ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE, with not more than 7,9 % ethylene oxide	(1),(2),(3),(5)		2,6	10	1,02	
	3299	ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE, with not more than 5,6 % ethylene oxide	(1),(2),(3),(5)		1,7	10	1,03	
	1078	REFRIGERANT GASES, N.O.S.	(1),(2),(3),(5)			10		n
		MIXTURE F1	(1),(2),(3),(5)		1,2	10	1,23	
		MIXTURE F2	(1),(2),(3),(5)		1,8	10	1,15	
		MIXTURE F3	(1),(2),(3),(5)		2,9	10	1,03	
		1968	INSECTICIDE GAS, N.O.S.	(1),(2),(3),(5)			10	
2°O	3163	LIQUEFIED GAS, N.O.S.	(1),(2),(3),(5)			10		n
	1070	NITROUS OXIDE	(1),(2),(3),(5)		18,0	10	0,68	g
			(1),(2),(3),(5)		22,5	10	0,74	g
			(1),(2),(3),(5)		25,0	10	0,75	g
2°F	3157	LIQUEFIED GAS, OXIDIZING, N.O.S.	(1),(2),(3),(5)			10		n
	1010	1,2-BUTADIENE, INHIBITED or 1,3-BUTADIENE, INHIBITED or MIXTURES OF 1,3-BUTADIENE AND HYDROCARBONS, INHIBITED	(1),(2),(3),(5)		1,0	10	0,59	f
			(1),(2),(3),(5)		1,0	10	0,55	f
			(1),(2),(3),(5)			10	0,50	f,j
	1011	BUTANE	(1),(2),(3),(5)		1,0	10	0,51	
	1012	BUTYLENES MIXTURE or	(1),(2),(3),(5)			10	0,50	j
	1012	1-BUTYLENE or	(1),(2),(3),(5)		1,0	10	0,53	
	1012	CIS-2-BUTENE or	(1),(2),(3),(5)		1,0	10	0,55	
	1012	TRANS-2-BUTYLENE	(1),(2),(3),(5)		1,0	10	0,54	
	1027	CYCLOPROPANE	(1),(2),(3),(5)		2,0	10	0,53	
	1030	1,1-DIFLUOROETHANE (REFRIGERANT GAS R 152a)	(1),(2),(3),(5)		1,8	10	0,79	
	1032	DIMETHYLAMINE, ANHYDROUS	(1),(2),(3),(5)		1,0	10	0,59	b
	1033	DIMETHYL ETHER	(1),(2),(3),(5)		1,8	10	0,58	
	1035	ETHANE	(1),(2),(3),(5)		9,5	10	0,25	g
			(1),(2),(3),(5)		12,0	10	0,29	g
			(1),(2),(3),(5)		30,0	10	0,39	g
	1036	ETHYLAMINE	(1),(2),(3),(5)		1,0	10	0,61	b
	1037	ETHYL CHLORIDE	(1),(2),(3),(5)		1,0	10	0,80	a
	1039	ETHYL METHYL ETHER	(1),(2),(3),(5)		1,0	10	0,64	
	1041	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE, with more than 9 % ethylene oxide but not more than 87 %	(1),(2),(3),(5)		19,0	10	0,66	g
			(1),(2),(3),(5)		25,0	10	0,75	g
	1055	ISOBUTYLENE	(1),(2),(3),(5)		1,0	10	0,52	

⁽¹⁾ Not applicable for receptacles made of composite materials [see marginal 2217(2)].

2250
(cont'd)

Item No and Group	Identi- fication No	Name of the substance or article	Packing	Test		Filling	Special re- quire- ments	
			Type of receptacle (Marginal 2211)	Pressure		Period (years) (¹) kg/l or MPa or Vol %		
				X fill. press.	MPa			
2°F (cont'd)	1060	METHYLACETYLENE AND PROPADI- ENE MIXTURE, STABILIZED	(1),(2),(3),(5)			10	c,f,j	
		Propadiene with 1 % to 4 % methylacetylene	(1),(2),(3),(5)		2,2	10	0,50	c,f
		MIXTURE P1	(1),(2),(3),(5)		3,0	10	0,49	c,f
		MIXTURE P2	(1),(2),(3),(5)		2,4	10	0,47	c,f
	1061	METHYLAMINE, ANHYDROUS	(1),(2),(3),(5)		1,3	10	0,58	b
	1063	METHYL CHLORIDE (REFRIGERANT GAS R 40)	(1),(2),(3),(5)		1,7	10	0,81	a
	1077	PROPYLENE	(1),(2),(3),(5)		3,0	10	0,43	
	1081	TETRAFLUROETHYLENE, INHIBITED	(1),(2),(3),(5)		20,0	10	0,5 MPa	f
	1083	TRIMETHYLAMINE, ANHYDROUS	(1),(2),(3),(5)		1,0	10	0,56	b
	1085	VINYL BROMIDE, INHIBITED	(1),(2),(3),(5)		1,0	10	1,37	a,f
	1086	VINYL CHLORIDE, INHIBITED	(1),(2),(3),(5)		1,2	10	0,81	a,f
	1087	VINYL METHYL ETHER, INHIBITED	(1),(2),(3),(5)		1,0	10	0,67	f
	1860	VINYL FLUORIDE, INHIBITED	(1),(2),(3),(5)		25,0	10	0,64	a,f,g
	1912	METHYLCHLORIDE AND METHYLENE CHLORIDE MIXTURE	(1),(2),(3),(5)		1,7	10	0,81	a
	1959	1,1-DIFLUOROETHYLENE (REFRIGER- ANT GAS R 1132a)	(1),(2),(3),(5)		25,0	10	0,77	g
	1969	ISOBUTANE	(1),(2),(3),(5)		1,0	10	0,49	
	1978	PROPANE	(1),(2),(3),(5)		2,5	10	0,42	
	2035	1,1,1-TRIFLUOROETHANE (REFRIGER- ANT GAS R 143a)	(1),(2),(3),(5)		3,5	10	0,75	
	2044	2,2-DIMETHYLPROPANE	(1),(2),(3),(5)		1,0	10	0,53	
	2200	PROPADIENE, INHIBITED	(1),(2),(3),(5)		2,2	10	0,50	f
	2419	BROMOTRIFLUOROETHYLENE	(1),(2),(3),(5)		1,0	10	1,19	
	2452	ETHYLACETYLENE, INHIBITED	(1),(2),(3),(5)		1,0	10	0,57	c,f
	2453	ETHYL FLUORIDE (REFRIGERANT GAS R 161)	(1),(2),(3),(5)		3,0	10	0,57	
	2454	METHYL FLUORIDE (REFRIGERANT GAS R 41)	(1),(2),(3),(5)		30,0	10	0,36	
	2517	1-CHLORO-1,1-DIFLUOROETHANE (REFRIGERANT GAS R 142b)	(1),(2),(3),(5)		1,0	10	0,99	
	2601	CYCLOBUTANE	(1),(2),(3),(5)		1,0	10	0,63	
	3153	PERFLURO(METHYL VINYL ETHER)	(1),(2),(3),(5)		2,0	10	0,75	
	3154	PERFLURO(ETHYL VINYL ETHER)	(1),(2),(3),(5)		1,0	10	0,98	
	3252	DIFLUOROMETHANE (REFRIGERANT GAS R 32)	(1),(2),(3),(5)		4,8	10	0,78	
	1965	HYDROCARBON GAS MIXTURE, LIQUE- FIED, N.O.S.	(1),(2),(3),(5)			10		m,n
		MIXTURE A	(1),(2),(3),(5)		1,0	10	0,50	
		MIXTURE A0	(1),(2),(3),(5)		1,5	10	0,47	
		MIXTURE A1	(1),(2),(3),(5)		2,0	10	0,46	
		MIXTURE B	(1),(2),(3),(5)		2,5	10	0,43	
		MIXTURE C	(1),(2),(3),(5)		3,0	10	0,42	
	3161	LIQUEFIED GAS, FLAMMABLE, N.O.S.	(1),(2),(3),(5)			10		n
2°F	1062	METHYL BROMIDE	(1),(2),(3),(5)		1,0	5	1,51	a
	1581	CHLOROPICRIN AND METHYL BRO- MIDE MIXTURE	(1),(2),(3),(5)		1,0	5	1,51	a
	1582	CHLOROPICRIN AND METHYL CHLO- RIDE MIXTURE	(1),(2),(3),(5)		1,7	5	0,81	a

(¹) Not applicable for receptacles made of composite materials [see marginal 2217(2)].

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(cont'd)

Item No and Group	Identi- fication No	Name of the substance or article	Packing	Test			Filling	Special re- quire- ments	
			Type of receptacle (Marginal 2211)	Pressure		Period (years) · ⁽¹⁾	Max. fill. degree kg/l or MPa or Vol %		
				X fill. press.	MPa				
2°T <i>(cont'd)</i>	2191	SULPHURY FLUORIDE	(1),(2),(3),(5)		5,0	5	1,10	k	
	1967	INSECTICIDE GAS, TOXIC, N.O.S.	(1),(2),(3),(5)			5		n	
	3162	LIQUEFIED GAS, TOXIC, N.O.S.	(1),(2),(3),(5)			5		n	
2°TF	1026	CYANOGEN	(1),(2),(3),(5)		10,0	5	0,70	k	
	1040	ETHYLENE OXIDE, or ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1MPa (10 bar) at 50 °C	(1),(2),(3),(5)		1,5	5	0,78	f	
	1053	HYDROGEN SULPHIDE	(1),(2),(3),(5)		5,5	5	0,67	k	
	1064	METHYL MERCAPTAN	(1),(2),(3),(5)		1,0	5	0,78	k	
	1082	TRIFLUOROCHLOROETHYLENE, INHIBITED	(1),(2),(3),(5)		1,9	5	1,13	f,k	
	2188	ARSINE	(1),(5)		4,2	5	1,10	e,l	
	2192	GERMANE ⁽²⁾	(1),(5)		25,0	5	1,02	e,g,l	
	2199	PHOSPHINE ⁽²⁾	(1),(5)		22,5	5	0,30	e,g,l	
			(1),(5)		25,0	5	0,51	e,g,l	
	2202	HYDROGEN SELENIDE, ANHYDROUS	(1),(5)		3,1	5	1,60	e,l	
	2204	CARBONYL SULPHIDE	(1),(2),(3),(5)		2,6	5	0,84	k	
	2676	STIBINE	(1),(5)		2,0	5	1,2	e,l	
	3300	ETHYLENE OXIDE AND CARBON DIO- XIDE MIXTURE with more than 87 % ethyl- ene oxide	(1),(2),(3),(5)		2,8	5	0,73	f	
	3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.	(1),(2),(3),(5)			5		n	
	2°TC	1005	AMMONIA, ANHYDROUS	(1),(2),(3),(5)		3,3	10	0,53	b
		1017	CHLORINE	(1),(2),(3),(5)		2,2	5	1,25	a
1048		HYDROGEN BROMIDE, ANHYDROUS	(1),(2),(3),(5)		6,0	3	1,54	a	
1050		HYDROGEN CHLORIDE, ANHYDROUS	(1),(2),(3),(5)		10,0	3	0,30	a,g	
			(1),(2),(3),(5)		12,0	3	0,56	a,g	
			(1),(2),(3),(5)		15,0	3	0,67	a,g	
			(1),(2),(3),(5)		20,0	3	0,74	a,g	
1069		NITROSYL CHLORIDE	(1),(5)		1,3	3	1,10	e,l	
1076		PHOSGENE	(1),(3),(5)		2,0	3	1,23	e,l	
1079		SULPHUR DIOXIDE	(1),(2),(3),(5)		1,4	3	1,23		
1589		CYANOGEN CHLORIDE, INHIBITED	(1),(5)		2,0	3	1,03	e,f,l	
1741		BORON TRICHLORIDE	(1),(2),(3),(5)		1,0	3	1,19		
2194		SELENIUM HEXAFLUORIDE	(1),(5)		20,0	3	1,3	e,g,l	
2195		TELLURIUM HEXAFLUORIDE	(1),(5)		2,0	3	1,0	e,l	
2196		TUNGSTEN HEXAFLUORIDE	(1),(5)		1,0	3	2,70	a,e,l	
2197		HYDROGEN IODIDE, ANHYDROUS	(1),(2),(3),(5)		2,3	3	2,25	a	

⁽¹⁾ Not applicable for receptacles made of composite materials [see marginal 2217(2)].⁽²⁾ Considered as pyrophoric.

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(cont'd)

Item No and Group	Identi- fication No	Name of the substance or article	Packing	Test		Filling	Special re- quire- ments	
			Type of receptacle (Marginal 2211)	Pressure		Period (years) (¹)		Max. fill. degree kg/l or MPa or Vol %
				X fill. press.	MPa			
2°TC (cont'd)	2418	SULPHUR TETRAFLUORIDE	(1),(5)		3,0	3	0,91	e,l
	2420	HEXAFLUOROACETONE	(1),(2),(3),(5)		2,2	3	1,08	
	3057	TRIFLUOROACETYL CHLORIDE	(1),(2),(3),(5)		1,7	3	1,17	
	3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.	(1),(2),(3),(5)			3		n
2°TO	3083	PERCHLORYL FLUORIDE	(1),(2),(3),(5)		3,3	5	1,21	e,k,l
	3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.	(1),(2),(3),(5)			5		n
2°TFC	2189	DICHLOROSILANE	(1),(2),(3),(5)		1,0	3	0,90	
	2534	METHYLCHLOROSILANE	(1),(2),(3),(5)			3		j
	3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE,N.O.S.	(1),(2),(3),(5)			3		n
2°TOC	1067	DINITROGEN TETROXIDE (NITROGEN DIOXIDE),	(1),(3),(5)		1,0	3	1,30	e,l
	1749	CHLORINE TRIFLUORIDE	(1),(2),(3),(5)		3,0	3	1,40	a
	1975	NITRIC OXIDE AND DINITROGEN TE- TROXIDE MIXTURE (NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURE)	(1),(2),(3),(5)			3		e,j,l
	2548	CHLORINE PENTAFLUORIDE	(1),(5)		1,3	3	1,49	a,e,l
	2901	BROMINE CHLORIDE	(1),(2),(3),(5)		1,0	3	1,5	a
	3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	(1),(2),(3),(5)			3		n
3°A	1913	NEON, REFRIGERATED LIQUID	(4)	1,3		10	98 %	
	1951	ARGON, REFRIGERATED LIQUID	(4)	1,3		10	98 %	
	1963	HELIUM, REFRIGERATED LIQUID	(4)	1,3		10	98 %	
	1970	KRYPTON, REFRIGERATED LIQUID	(4)	1,3		10	98 %	
	1977	NITROGEN, REFRIGERATED LIQUID	(4)	1,3		10	98 %	
	2187	CARBON DIOXIDE, REFRIGERATED LIQUID	(4)	1,3		10	98 %	
	2591	XENON, REFRIGERATED LIQUID	(4)	1,3		10	98 %	
	3136	TRIFLUOROMETHANE, REFRIGER- ATED LIQUID	(4)	1,3		10	98 %	
	3158	GAS, REFRIGERATED LIQUID, N.O.S.	(4)	1,3		10	98 %	n
3°O	1003	AIR, REFRIGERATED LIQUID	(4)	1,3		10	98 %	
	1073	OXYGEN, REFRIGERATED LIQUID	(4)	1,3		10	98 %	
	2201	NITROUS OXIDE, REFRIGERATED LIQUID	(4)	1,3		10	98 %	
	3311	GAS, REFRIGERATED, LIQUEFIED, OXI- DIZING, N.O.S.	(4)	1,3		10	98 %	n

(¹) Not applicable for receptacles made of composite materials [see marginal 2217(2)].

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(cont'd)

Item No and Group	Identification No	Name of the substance or article	Packing	Test		Filling	Special re-quirements	
			Type of receptacle (Marginal 2211)	Pressure		Period (years) (¹)		Max. fill. degree kg/l or MPa or Vol %
				X fill. press.	MPa			
3°F	1038	ETHYLENE, REFRIGERATED LIQUID	(4)	1,3		10	95 %	c
	1961	ETHANE, REFRIGERATED LIQUID	(4)	1,3		10	95 %	
	1966	HYDROGEN, REFRIGERATED LIQUID	(4)	1,3		10	95 %	
	1972	METHANE, REFRIGERATED LIQUID or	(4)	1,3		10	95 %	
	1972	NATURAL GAS, REFRIGERATED LIQUID, with high methane content	(4)	1,3		10	95 %	
	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	(4)	1,3		10	95 %	
4°A	3312	GAS, REFRIGERATED, LIQUEFIED, FLAMMABLE, N.O.S.	(4)	1,3		10	95 %	n
	2073	AMMONIA SOLUTION, relative density less than 0,88 at 15 °C with more than 35 % and not more than 40 % ammonia	(1),(2),(3),(5)		1,0	5	0,80	
		with more than 40 % and not more than 50 % ammonia	(1),(2),(3),(5)		1,2	5	0,77	
4°F	1001	ACETYLENE , DISSOLVED	(1),(5)		6,0	5		c,h,i
4°TC	3318	AMMONIA SOLUTION,relative density less than 0,880 at 15 °C in water, with more than 50 % ammonia	(1),(2),(3),(5)			10		j

(¹) Not applicable for receptacles made of composite materials [see marginal 2217(2)].

CLASS 3

FLAMMABLE LIQUIDS

2300 (2) Amend the first subparagraph to read:

‘— are liquid according to marginal 2000(6)’,

Amend the second subparagraph to read as follows:

‘— have at 50 °C a vapour pressure of not more than 300 kPa (3 bar) and are not completely gaseous at 20 °C and the standard pressure of 101,3 kPa; and’

(6) Amend to read as follows:

‘(6) Liquids which are highly toxic on inhalation, flammable, having a flashpoint below 23 °C are substances of Class 6,1 (marginal 2601, 1° to 10°)’.

2301 1° (a) In entry 1108 italicize the synonym.

2° (a) Amend the name of entry 1280 to read: ‘1280 *propylene oxide*’.

3° (b) Halogenated substances:

Delete the italics of the synonym of entry 1126.

Delete the synonym to 1279.

Ketones: Delete entry 1251.

2301
(cont'd)

5° (a) to (c) Insert the following text after '1139 coating solution':

'(including surface treatments or coatings used for industrial or other purposes, such as vehicle under coating, drum or barrel lining)'.

Amend note 1 under B. to read as follows:

'Note: 1. Liquids which are highly toxic on inhalation, having a flashpoint below 23 °C (marginal 2601, 1° to 10°) and toxic substances having a flashpoint equal to or greater than 23 °C are substances of Class 6.1.'

Amend the end of note 3 under B. to read as follows:

'see marginal 2600 (3)'.

Amend the end of note 2 under B. to read as follows:

'see marginal 2800 (3)'.

22° Amend the note to read:

'1032 dimethylamine, anhydrous, 1036 ethylamine, 1061 methylamine, anhydrous, and 1083 trimethylamine, anhydrous, are substances of Class 2 (see marginal 2201, 2°F).'

31° c) Halogenated substances: Delete entry 2711.

Alcohols: Delete entry 2686.

Aldehydes: Delete entry 1199.

Ketones: Delete entry 2310.

Esters: Amend entries 1914 and 2348 to read:

'1914 *butyl propionates*' and '2348 *butyl acrylates, inhibited*'.

Delete entry 2708.

Substances containing nitrogen: Delete entry 2906.

Other flammable substances ...:

Add the following text after '1139 coating solution'

'(including surface treatments or coatings used for industrial or other purposes, such as vehicle under coating, drum or barrel lining)'.

32° (c) Add: '2310 *pentane-2,4-dione*'

F. Section 'F', amend as follows:

'F. Substances and preparations used as pesticides having a flashpoint below 23 °C

Note: 1. Flammable liquid substances and preparations, used as pesticides, which are highly toxic, toxic or slightly toxic and have a flashpoint of 23 °C or above are substances of Class 6.1 (see marginal 2601, 71° to 73°).

2. The table in marginal 2601, 71° to 73°, contains a list of common pesticides and a reference to the identification numbers assigned to names that are relevant to the generic chemical group (e.g. organophosphorus pesticide) to which the particular pesticide belongs. The description used in the transport of the pesticide shall include the name selected from those referenced on the basis of the active ingredient, of the physical state of the pesticide and any subsidiary risks it may exhibit, supplemented by the indication of the active ingredient.

3. Substances and preparations used as pesticides listed under item number 41° shall be classified under (a) or (b) according to their boiling point and their degree of toxicity. The classification into "highly toxic", "toxic" and "slightly toxic" of all active substances and their preparations used as pesticides shall be effected in accordance with marginal 2600 (3).

2301 41° Pesticides, liquid, flammable, toxic, flashpoint less than 23 °C

(cont'd)

In this item, substances and preparations listed below must be classified under letter (a) or (b) as follows:

- (a) substances and preparations having a boiling point or initial boiling point not exceeding 35 °C and/or highly toxic;
- (b) substances and preparations having a boiling point or initial boiling point exceeding 35 °C and toxic or slightly toxic.

2758 *carbamate pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2760 *arsenical pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2762 *organochlorine pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2764 *triazine pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2766 *phenoxy pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2768 *phenyl urea pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2770 *benzoic derivative pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2772 *dithiocarbamate pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2774 *phthalimide derivative pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2776 *copper based pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2778 *mercury based pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2780 *substituted nitrophenol pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2782 *bipyridilium pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2784 *organophosphorus pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

2787 *organotin pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

3024 *coumarin derivative pesticide, liquid, flammable, toxic, flashpoint less than 23 °C;*

3021 *pesticide, liquid, flammable, toxic, n.o.s., flashpoint less than 23 °C.'*

Delete items 42° to 57°.

61° (c) For entry 3256 add at the end:

'(including molten metals and molten salts)'.

Add a note as follows:

'Note: 3257 elevated temperature liquid, n.o.s., at or above 100 °C and, for a substance with a flash-point, below its flash-point, (including molten metals and molten salts) is a substance of Class 9 [see marginal 2901, 20° (c)]'.

71° Add the following note:

'Note: Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), which have contained substances of this Class are not subject to the conditions of this Directive if adequate measures have been taken to nullify any hazard. Hazards are nullified if adequate measures have been taken to nullify all hazards of Classes 1 to 9.'

2301a Amend the beginning as follows:

‘Neither the provisions for this Class contained in this Annex nor those contained in Annex B, except as provided for in paragraph (7) below, are applicable to:’

(1) Replace ‘41° to 57°’ by ‘41°’.

(2) Insert a new paragraph (2) as follows:

‘Substances classified under (b) and (c) of 2° to 5°, 21° to 26°, 31° to 34° and 41°, contained in metal or plastics inner packagings and carried in shrink-wrapped or stretch-wrapped trays as outer packagings in conformity with the following provisions:

- (a) Substances classified under (b) of each item, except 5° (b) and alcoholic beverages of 3° (b): not more than 1 litre per metal inner packaging or 500 ml per plastics inner packaging, and not more than 12 litres per package;
- (b) Alcoholic beverages of 3° (b): not more than 1 litre per metal inner packaging or 500 ml per plastics inner packaging;
- (c) Substances classified under 5° (b): not more than 1 litre per metal inner packaging or 500 ml per plastics inner packaging and not more than 20 litres per package;
- (d) Substances classified under (c) of each item: not more than 5 litres per inner packaging.

The total gross mass of the package shall not exceed 20 kg in any case.

The “general conditions of packing” of marginal 3500 (1), (2) and (5) to (7) shall be observed.

Note: In the case of homogeneous mixtures containing water, the quantities specified relate only to the substance of this Class contained in those mixtures.’

Existing (2) is renumbered as (3).

(3) Replace existing paragraph (3) by the following new paragraphs:

‘(4) Fuel contained in the tanks of a vehicle performing a transport operation and destined for its propulsion or for the operation of any of its equipment.

(5) Fuel contained in the tanks of vehicles or of other means of conveyance (such as boats) which are carried as a load, where it is destined for their propulsion or the operation of any of their equipment. Any fuel cocks between the engine or equipment and the fuel tank shall be closed during carriage unless it is essential for the equipment to remain operational. Where appropriate, the vehicles or other means of conveyance shall be loaded upright and secured against falling.

(6) The fuel referred to in paragraph (4) and (5) above may be carried in fixed fuel tanks, directly connected to the vehicle’s engine and/or auxiliary equipment, which comply with the technical requirements (in so far as they relate to fuel tanks) of ECE Regulation 34⁽¹⁾ as amended or of Directive 70/221/EEC⁽²⁾ or may be carried in portable fuel containers (such as jerricans). The total capacity of the fixed tanks shall not exceed 1 500 litres per transport unit and the capacity of a tank fitted to a trailer shall not exceed 500 litres. A maximum of 60 litres per transport unit may be carried in portable fuel containers. These restrictions shall not apply to vehicles operated by the emergency services.’

(1) Regulation No 34 (Uniform provisions concerning the approval of vehicles with regard to the prevention of fire risks), (in its latest amended form) annexed to the Agreement concerning the adoption of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipment and parts done at Geneva on 20 March 1958.

(2) Council Directive 70/221/EEC of 20 March 1970 on the approximation of the laws of the Member States relating to liquid fuel tanks and rear protective devices for motor vehicles and their trailers, published in the Official Journal of the European Communities L 76 of 6. 4. 1970.

- 2301a** (7) Add a new a paragraph (7) as follows:
(*cont'd*)
- '(7) For carriage in accordance with paragraph (1) and (2) above the description of the goods in the transport document shall conform to the requirements of marginal 2314 and include the words "limited quantity". Each package shall be clearly and durably marked with the identification number of the goods shown in the transport document, preceded by the letters "UN".'
- 2304** (1) (a) and (b): Amend the reference 'marginals 2215 (1) and 2216' to read 'marginals
(2) (b) 2215 to 2217'.
- 2305** (c) Insert 'or aluminium' after 'steel'.
- 2306** (1) (c) Insert 'or aluminium' after 'steel'.
Note 2: Replace 3560 by 3561.
(2) Replace '41° to 57°' by '41°'.
- 2307** (1) (c) Insert 'or aluminium' after 'steel'.
Note 2: Replace 3560 by 3561.
(2) Delete 'rigid' before '... plastics inner receptacle'.
Add the following text:
'IBCs of type 31HZ2 shall be filled to at least 80 % of the volume of the outer casing. In addition, IBCs of type 31HZ2 shall always be carried in closed transport units.'
- 2308** (3) Replace '41° to 57°' by '41°'.
- 2311** (7) Delete.
Renumber (8) and (9) as (7) and (8).
(8) [new (7)] Delete '2001 (7)'.
- 2312** (3) Replace '41° to 57°' by '41°'.
(6) Delete.
Renumber (7) as (6).
- 2314** (1) Replace the fourth sub-paragraph with the following text:
'For the carriage of substances and preparations used as pesticides of 41°, the description of the goods shall include the name of the active ingredient(s) in conformity with the nomenclature approved by ISO ⁽²⁾ or the table in marginal 2601, 71° to 73° or the chemical name of the active ingredient(s), e.g. "2784 organophosphorus pesticide, liquid, flammable, toxic (Dimephos), 3, 41° (b), ADR."
Add the following sentence to the end of the paragraph:
'When, by derogation to marginal 10 500 (2), a multi-compartment tank-vehicle is marked according to marginal 31 500(2) the substance contained in each compartment shall be specified in the transport document.'
Delete existing footnote ⁽²⁾
Add a new footnote:
'⁽²⁾ See ISO 1750:1981, as amended, and addenda.'
- 2325** and Section D: delete.
Renumber marginals as
2323-2399

CLASS 4.1

FLAMMABLE SOLIDS

- 2400 (2) Amend the first sentence to read: 'The title of Class 4.1 covers substances and articles which are not liquid according to marginal 2000 (6) or which are self-reactive liquids.'

Note: 1. Replace '[see Appendix A.1, marginal 3104 (2) (g)]' with '[see Manual of Tests and Criteria, Part II, paragraph 20.4.2 (g)]'.

3. Replace the last sentence with 'Requirements for the determination of the SADT are given in the Manual of Tests and Criteria, Part II, Sections 20 and 28.4'.

(4), (5), (6), (8) and (9):

For 'in accordance with Appendix A.3, marginals 3320 and 3321', read 'in accordance with the Manual of Tests and Criteria, Part III, section 33.2.1'.

(13) and (15):

Replace the reference to 'Appendix A.1, marginal 3104' with a reference to 'Manual of Tests and Criteria, Part II'.

(14) Replace '[see Appendix A.1, marginal 3104 (2) (a)]' with '[see Manual of Tests and Criteria, Part II, paragraph 20.4.2 (a)]'.

(18) Replace 'OP2A or OP2B' by 'OP2'

(20) Amend the last sentence of the second paragraph to read: 'Provisions for the determination of the SADT are given in the Manual of Tests and Criteria, Part II, Chapter 20 and Section 28.4'.

- 2401 2° c) Insert the following note:

'*Note:* Special packing requirements are applicable for 1331 matches, "strike anywhere" [see marginal 2407 (4)].'

- 3° Add the following new entry:

'(b) 3270 *nitrocellulose membrane filters*

Note: 1. The nitrogen content of the nitrocellulose shall not exceed 11,5 %. Each single filter sheet shall be packed between sheets of glazed paper. The portion of glazed paper between the filter sheets shall be not less than 65 %, by mass. The membrane filters/paper arrangement shall not be liable to propagate a detonation as tested by one of the tests described in Manual of Test and Criteria, Part I, Test series 1(a).

2. 3270 nitrocellulose membrane filters shall be packed in receptacles so constructed that explosion is not possible by reason of increased internal pressure.'

4° (c) Replace '100 °C' by '61 °C'.

- 11° (c) The existing note is numbered note 2; add a new note 1 to read as follows:

'*Note:* 1. 1350 Sulphur is not subject to the provisions of this Directive

(a) when it is carried in quantities of less than 400 kg per package; or

(b) when it has been formed to a specific shape (e.g. pills, granules, pellets, pastilles or flakes)'

- 13° (b) Insert the following note 1:

'*Note:* 1. Ferrocium (lighter flints), stabilized against corrosion, with a minimum iron content of 10 % is not subject to the provisions of this Directive.'

Existing notes 1 and 2, renumber as notes 2 and 3.

2401
(cont'd)

Under the heading 'C. Explosive substances in the non-explosive state', add a new note 2 as follows:

'Note: 2. Nitroglycerin mixture with more than 2 % but not more than 10 % nitroglycerin, by mass, desensitized, which has been assigned to identification No 3319 of the Recommendations on the Transport of Dangerous Goods, shall only be accepted for carriage as a substance of Class 4.1 if it meets the requirements of the competent authority (see also marginal 2101, 4^o, identification No 0143).'

Note 2, renumber as note 3.

Amend items 21^o and 22^o to read as follows:

'21^o Water-wetted explosive substances

(a) 1. The following water-wetted explosive substances:

(existing text of (a) with deletion of the last entry

'2852 *dipicryl sulphide, wetted*'.

and addition of the following entry:

'3317 *2-amino-4,6-dinitrophenol, wetted* with not less than 20 % water by mass').

2. The following water-wetted explosive substances, provided they are carried in quantities of not more than 500 g per package:

0154 *trinitrophenol (picric acid)* wetted with not less than 10 % water, by mass

Note: For trinitrophenol wetted with not less than 30 % water by mass, see under 1. above.

0155 *trinitrochlorobenzene (picryl chloride)* wetted with not less than 10 % water, by mass.

0209 *trinitrotoluene (TNT)* wetted with not less than 10 % water, by mass.

Note: For trinitrotoluene wetted with not less than 30 % water by mass, see under 1. above.

0214 *trinitrobenzene*, wetted with not less than 10 % water, by mass.

Note: For trinitrobenzene wetted with not less than 30 % water by mass, see under 1. above.

0215 *trinitrobenzoic acid*, wetted with not less than 10 % water, by mass.

Note: For trinitrobenzoic acid, wetted with not less than 30 % water by mass, see under 1. above.

2852 *dipicryl sulphide*, wetted with not less than 10 % water, by mass.

3. The following water-wetted explosive substance, provided that it is carried in quantities of not more than 11,5 kg per package:

0220 *urea nitrate*, wetted with not less than 10 % water, by mass, see under 1. above.

Note: For urea nitrate, wetted with not less than 20 % water by mass, see under 2. above.

Note: 1. Explosive substances listed under (a) 1. with a water content lower than the stated limits are substances of Class 1 (see marginal 2101, 4^o); however some of these substances may be carried under the conditions of Class 4.1 if they meet the conditions of (a) 2. or (a) 3.

2. Dipicryl sulphide, wetted with less than 10 % (mass) water is a substance of Class 1, identification number 0401 (see marginal 2101, 4^o).

3. Explosive substances with identification number 0154, 0155, 0209, 0214 or 0215 in quantities of more than 500 g per package and 0220 in quantities of more than 11,5 kg per package may be carried only under the conditions of Class 1.

4. Text of existing note 2.

5. Text of existing note 3, except that footnote (1) should read as follows:

2401 (cont'd) '(¹) anual of Tests and Criteria, Appendix 1.'

22° Toxic water-wetted explosive substances

- (a) 1. The following toxic water-wetted explosive substances:

[Text of existing (a)].

2. The following toxic water-wetted explosive substances provided that they are carried in quantities of not more than 500 g per package:

0234 sodium dinitro-o-cresolate, wetted with not less than 10 % water (by mass).

Note: For sodium dinitro-o-cresolate, wetted with not less than 15 % water by mass, see under 1. above.

Note: 1. Explosive substances listed under (a) 1. with a water content lower than the stated limits are substances of Class 1 (see marginal 2101, 4° and 26°). However sodium dinitro-o-cresolate, wetted with less than 15 % water may be carried under the conditions of Class 4.1 if the conditions of (a) 2. are met.

2. 0234 sodium dinitro-o-cresolate, wetted with less than 15 % water (by mass), in quantities of more than 500 g per package may be carried only under the conditions of Class 1.

3. Text of existing note 2.

4. Text of existing note 3 (footnote(¹) to read as follows: '(¹) See Manual of Tests and Criteria, Appendix 1'.

- 24° a) Replace '(a)' by '(b)'.

Note 1: Read:

'2555 nitrocellulose with not less than 25 % water, by mass, 2556...' (rest of text unchanged).

Insert the following new note 2:

'*Note:* 2. In the case of 2557 nitrocellulose with not more than 12,6 % nitrogen, by dry mass, mixture with or without plasticizer, with or without pigment, the formulation shall be prepared so that it remains homogeneous and does not separate during transport. Formulations not showing dangerous properties when tested for their liability to detonate, deflagrate or explode when heated under defined confinement by tests of Test series 1 (a), 2 (b) and 2 (c) respectively in the Manual of Tests and Criteria, Part I and not being a flammable solid when tested in accordance with test N.1 in the Manual of Tests and Criteria, Part III, subsection 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 Directive.'

Existing note 2, renumber as note 3.

- 26° (c) Add: '3241 2-bromo-2-nitropropane-1,3-diol'.

Note: 2. Replace '[see Appendix A.1, marginal 3101 (1)]' with '[see Manual of Tests and Criteria, Part I, Section 12]'.

- 32° to 46° Delete letters A and B, as appropriate, in references to packing methods 'OP2A', 'OP7A', 'OP2B', 'OP5B', 'OP6B' and 'OP7B'.

- 34° In the table, add:

Substance	Concentration (%)	Packing method (see marginal 2405)
Azodicarbonamide(¹) formulation type C	< 100	OP6

2401
(cont'd)

Insert the following footnote:

'⁽¹⁾ Azodicarbonamide formulations which fulfill the criteria of the Manual of Tests and Criteria, Part II, paragraph 20.4.2 (c).'

Renumber footnotes ⁽¹⁾ and ⁽²⁾ to ⁽³⁾ and ⁽⁴⁾.

36° In the table, add:

Substance	Concentration (%)	Packing method (see marginal 2405)
Azodicarbonamide ⁽¹⁾ formulation type D	< 100	OP7

'⁽¹⁾ Azodicarbonamide formulations which fulfill the criteria of the Manual of Tests and Criteria, Part II, paragraph 20.4.2 (d).'

41° Add a new footnote ⁽¹⁾ to read: '⁽¹⁾ See footnote ⁽¹⁾ to 35°(b).'

42° After '*formulation type B*', add 'temperature controlled'. In footnote ⁽¹⁾ amend the text 'Appendix A.1, marginal 3104 (2) (b)' to 'the Manual of Tests and Criteria, Part II, paragraph 20.4.2 (b)'

44° After '*azodicarbonamide, formulation type C*', add 'temperature controlled'. For the first entry (azodicarbonamide formulation type C temperature controlled) replace footnote ⁽¹⁾ with the following text:

'⁽¹⁾ Azodicarbonamide formulations which fulfil the criteria of the Manual of Tests and Criteria, Part II, paragraph 20.4.2 (c). The control and emergency temperatures shall be determined by the procedure in marginal 2400 (20).'

46° In footnote ⁽¹⁾ amend the text 'Appendix A.1, marginal 3104 (2) (b)' to 'the Manual of Tests and Criteria, Part II, paragraph 20.4.2 (d)'

47° (b) At the end, add:

Substance	Concentration (%)	Packing method (see marginal 2405)	Control temperature (°C)	Emergency temperature (°C)
Diethyleneglycol bis (allyl carbonate) + diisopropyl peroxydicarbonate	≥ 88 + ≤ 12	OP8	- 10	0

and delete '⁽¹⁾' after '*3237 self-reactive liquid type E, temperature controlled*'

51° Insert the following note:

'Note: Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), which have contained substances of this Class are not subject to the conditions of this Directive if adequate measures have been taken to nullify any hazard. Hazards are nullified if adequate measures have been taken to nullify all hazards of Classes 1 to 9.'

2401a Amend to read:

'(1) Substances of 1° to 4°, 6° and 11° to 14°, carried in accordance with the following provisions shall not be subject to the conditions for this Class contained in this Annex and in Annex B, except as provided for in paragraph (3) below:

(a) Substances classified under (b) of each item, up to 3 kg per inner packing and 12 kg per package;

(b) Substances classified under (c) of each item, up to 6 kg per inner packaging and 24 kg per package.

These quantities of substances shall be carried in combination packagings which at least meet the requirements of marginal 3538.

The "General packing conditions" of marginal 3500 (1), (2) and (5) to (7) shall be observed,

(2) Substances of 1° to 4°, 6° and 11° to 14° contained in metal or plastics inner packagings and carried in shrink-wrapped or stretch-wrapped trays as outer packagings in accordance with the following provisions shall not be subject to the conditions for this Class contained in this Annex and in Annex B, except as provided for in paragraph (3) below:

(a) Substances classified under (b) of each item: up to 500 g per inner packaging;

(b) Substances classified under (c) of each item: up to 3 kg per inner packaging.

The total gross mass of the package shall not exceed 20 kg in any case. The "General packing conditions" of marginal 3500 (1) and (2) and (5) to (7) shall be observed.

(3) For carriage in accordance with paragraph (1) and (2) above the description of the goods in the transport document shall conform to the requirements of marginal 2414 and include the words "limited quantities". Each package shall be clearly and durably marked with the identification number of the goods shown in the transport document, preceded by the letters "UN".'

2404 (2) c) Insert 'or aluminium' after 'steel'.

Insert before the paragraph beginning 'If 2557 ...', the following paragraph:

'2557 nitrocellulose, with not more than 12.6 % nitrogen, by dry mass, mixture with or without plasticizer, with or without pigment may also be packed in paper bags conforming to marginal 3536, provided that they make up a full load or are loaded on pallets.'

(3) (a) Insert the words 'other than 3241 2-bromo-2-nitropropane-1, 3 diol,' between 'item 26°' and 'shall be packed...'

Add the following new paragraph (c):

'(c) 3241 2-bromo-2-nitropropane-1,3-diol shall be packed in accordance with packing method OP6 as set out in marginal 2405 (1) and table 2 below.'

2405 Replace all references to 'Appendix A.1, marginal 3104 (2)' [subparagraphs (a) to (g) as the case may be] with references to the 'Manual of Tests and Criteria, Part II, paragraph 20.4.2' [subparagraphs (a) to (g) as appropriate]

(1) Amend the beginning to read:

'Substances of 31° to 50° shall be packed using the packing methods OP1 to OP8 in table 2 below, as indicated in marginal 2401. A packing method corresponding to a smaller package size (i.e. with a lower OP number ...' (remainder unchanged)

Add at the end:

'The quantities specified for each packing method represent the maximum that is currently considered good practice. The following types of packaging may be used:

— drums conforming to marginals 3520, 3521, 3523, 3525 or 3526; or

— jerricans conforming to marginals 3522 or 3526; or

— boxes conforming to marginals 3527, 3528, 3529, 3530, 3531 or 3532; or

2405 — composite packagings with a plastics inner receptacle conforming to marginal 3537,
(*cont'd*) provided that:

- (a) the requirements of Appendix A.5 are met;
- (b) metal packagings (including inner packagings of combination packagings and outer packagings of combination or composite packagings) are used solely for packing methods OP7 and OP8; and
- (c) in combination packagings, glass receptacles are used only as inner packagings with a maximum contents of 0,5 litre or 0,5 kg.'

'Table 2: MAXIMUM QUANTITY PER PACKAGING/PACKAGE^(a) FOR PACKING METHODS OP1 TO OP8

Packing method	OP1	OP2 ^(a)	OP3	OP4 ^(a)	OP5	OP6	OP7	OP8
Maximum quantity								
Maximum mass (kg) for solids and for combination packagings (liquids and solids)	0,5	0,5/10	5	5/25	25	50	50	200 ^(b)
Maximum contents in litres for liquids ^(c)	0,5	—	5	—	30	60	60	225 ^(d)

(^a) 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.

(^b) 60 kg for jerricans; 100 kg for boxes.

(^c) Viscous liquids should be treated as solids if the criteria of marginal 3310 for classification in Class 4.1 are met, or if they are not liquids according to the ASTM D 4359-90 test method.

(^d) 60 litres for jerricans.'

(3) Delete letter 'A' in the references to packing methods, and their alternatives 'or OP5B', 'or OP6B', 'or OP7B', 'or OP8B', 'or OP1B to OP4B'.

Tables 2 (A) and 2 (B), delete.

2406 (1) (c) Insert 'or aluminium' after 'steel'.

2407 Amend as follows:

(1) Amend the introductory sentence to read:

'Substances classified under (c) of 1° to 17°, except 1331 matches, "strike anywhere" of 2° (c), shall be packed in:'

(c) Insert 'or aluminium' after 'steel'.

(2) Insert the text ' , except 1331 matches "strike anywhere" of 2° (c)', after: 'Substances classified under (c) of 1° to 17°'.

(4) Add the following new paragraph (4):

'(4) 1331 matches, strike anywhere of 2°(c), shall be tightly packed, in sufficiently small quantities, in fibreboard, wood, plywood, reconstituted wood, or metal inner packagings so as to prevent accidental ignition under normal conditions of transport. Each inner packaging may not contain more than 700 matches. Inner packagings shall be packaged in outer packagings conforming to marginal 3520 for steel drums, marginal 3521 for aluminium drums, marginal 3522 for steel jerricans, marginal 3523 for plywood drums, marginal 3527 for natural wood boxes, marginal 3528 for plywood boxes, marginal 3529 for reconstituted wood boxes, marginal 3530 for fibreboard boxes, marginal 3531 for plastic boxes, or marginal 3532 for steel or aluminium boxes. Packagings shall not weigh more than 45 kg except for fibreboard boxes which shall not exceed 27 kg.'

- 2411 (3) Replace the words 'per receptacle' by the words 'per inner packaging'.
- (5) Delete '2001 (7)'.
- (6) Add at the end:
'[see, however, marginal 2407 (4)]'.
- 2414 Replace the text '(see Appendix A.1 marginal 3104 (2)(g))' by '[Manual of Tests and Criteria, Part II, paragraph 20.4.2 (g)]'.
- 2412 (5) Delete. Renumber (6) as (5).
- 2425 and Section D: Delete.
Renumber marginals as
- 2423-
2429

CLASS 4.2

SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION

- 2430 (4), (5), (6), (8) and (9)
- Replace 'in accordance with Appendix A.3, marginals 3330 to 3333' with 'in accordance with the Manual of Tests and Criteria, Part III, section 33,3'
- (5) Add two notes as follows:
- 'Note: 1. Substances carried in packages with a volume of not more than 3 m³ are exempted from Class 4.2 if, tested with a 10 cm sample cube at 120 °C, no spontaneous combustion nor a rise in temperature to over 180 °C is observed within 24 hours.
2. Substances carried in packages with a volume of not more than 450 litres are exempted from Class 4.2 if, tested with a 10 cm sample cube at 100 °C, no spontaneous combustion nor a rise in temperature to over 160 °C is observed within 24 hours.'
- (6) (b) Add a second sentence as follows:
- 'Substances with a temperature of spontaneous combustion higher than 50 °C for a volume of 450 litres are not to be assigned to letter (b).'
- (9) Replace the reference to paragraph (6) with a reference to paragraph (5).
- 2431 5° (b) and (c): Add '3313 *organic pigments, self-heating*'.
- 12° Delete the Note to (a) and (b).
- 13° (b) Renumber existing note as note 1.
- Add the following new note 2:
- 'Note 2: 1931 Zinc dithionite is a substance of Class 9, [see marginal 2901, 32° (c)].'
- 14° Add the following note:
- 'Note: The group of alkaline earth metals includes magnesium, calcium, strontium and barium.'

2431 15° Renumber existing note as note 1.

(cont'd)

At the end, add:

'Note: 2. The group of alkali metals includes the elements lithium, sodium, potassium, rubidium and caesium.'

16° (c) Add the following new note 1:

'Note: 1. Maneb and maneb preparations stabilized against self-heating need not be classified in Class 4.2 when it can be demonstrated by testing that a cubic volume of 1 m³ of substance does not self-ignite and that the temperature at the centre of the sample does not exceed 200 °C, when the sample is maintained at a temperature of not less than 75 °C ± 2 °C for a period of 24 hours.'

Present note, renumber as note 2.

2433 (3) Add a new paragraph (3) to read:

'(3) Substances of 31° (a), excluding 2005, magnesium diphenyl, of 32°, may also be packed in combination packagings conforming to marginal 3538, with hermetically closing glass inner packagings, with a capacity of not more than 1 litre, which shall be firmly secured individually in metal packagings by means of cushioning materials. The glass packagings shall not be filled to more than 90 % of their capacity. The following outer packagings may be used: removable head steel drums conforming to marginal 3520, removable head aluminium drums conforming to marginal 3521, plywood drums conforming to marginal 3523, fibre drums conforming to marginal 3525, steel or aluminium boxes conforming to marginal 3532, boxes of natural wood conforming to marginal 3527, plywood boxes conforming to marginal 3528, reconstituted wood boxes conforming to marginal 3529, and fibreboard boxes conforming to marginal 3530. By derogation from marginal 3538, wooden barrels conforming to marginal 3524 may also be used as outer packagings.'

Such combination packagings shall conform to a design type which has been tested and approved in accordance with Appendix A.5 for packing group I.

A package shall not contain more than 30 litres of substances.'

2435 (1), (2), (3) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.

(3) Renumber existing paragraphs (b) and (c) to (c) and (d).

Insert a new subparagraph (b) as follows:

'(b) removable head steel drums conforming to marginal 3520, provided that the drums have been subjected to a leakproofness test conforming to marginal 3553, or'

2436 (1) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.

(4) Insert a new paragraph (4) to read:

'3313 organic pigments, self-heating, of 5° (b) may also be packed in:

(a) multiwall, water-resistant paper bags (5M2), conforming to marginal 3536,

(b) woven plastics bags, sift-proof, (5H2), conforming to marginal 3534,

(c) flexible IBCs conforming to marginal 3623, with the exception of types 13H1, 13L1 and 13M1.

The packagings and IBCs referred to under (a), (b) and (c) may be transported only as full loads or loaded on pallets.'

- 2437 (1) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.
- (3) (b) Read:
- 'bags, sift-proof (5L2) conforming to marginal 3533, woven plastics bags, sift-proof (5H2), conforming to marginal 3534, plastics film bags (5H4) conforming to marginal 3535, or multi-wall water-resistant paper bags (5M2), conforming to marginal 3536.'
- 2441 (5) Delete '2001 (7)'.
- 2442 (6) Delete. Renumber (7) as (6).
- (7) [new (6)] Delete the words 'covered with water'.

CLASS 4.3

SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

- 2470 (1) Amend the beginning to read: 'Among the substances and articles covered...'
- Amend the beginning of the note to read:
- 'For the quantities of substances and articles listed in...'
- (2) Insert the words 'and articles' after 'substances'.
- (3) Insert new 'C', to read:
- 'C. Articles containing substances which, in contact with water, emit flammable gases.'
- Reletter existing 'C' to 'D'.
- Amend the text 'Substances of Class 4.3...' to read 'Substances and articles of Class 4.3...' (twice).
- (4), (5), (6), (8), (9), Replace:
- 'in accordance with Appendix A.3, marginals 3340 and 3341' with 'in accordance with the Manual of Tests and Criteria, Part III, section 33.4'.
- 2471 Notes 1 and 2 under title B: read 'The groups of...' instead of 'The term...'
- 11° Insert a new Note 4, as follows:
- 'Note: 4. 3292 Batteries, containing sodium or 3292 Cells, containing sodium are articles of item 31° (b).
- 13° (b) and (c) Amend entry 3170 to read:
- '3170 aluminium smelting by-products or*
3170 aluminium remelting by-products.'
- 20° (c) At the end of the note read '2471a (1)(c)'.
- Insert a new Section C, as follows:
- 'C. Articles containing substances which, in contact with water, emit flammable gases.**
- Note: Special packing conditions are applicable to these articles [see marginal 2473(5)].*

2471 31° (b) *Batteries, containing sodium, or*
(cont'd) 3292 *Cells, containing sodium*

- Note:* 1. Batteries or cells shall not contain substances of this Directive other than sodium, sulphur or polysulphides.
2. Batteries or cells shall not be offered for carriage at a temperature such that liquid elemental sodium is present in the battery or cell unless approved and under the conditions established by the competent authority of the country of origin.
3. 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 contents under normal conditions of carriage.
4. 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 carriage.'

Renumber existing section C to D

Renumber existing item 31° to 41°.

41° (old 31°):

41° (old 31°) The words 'substances of Class 4.3' are replaced with 'substances and articles of Class 4.3'.

2471a Existing text becomes 2471a (1) with the first sentence amended to read as follows:

'Substances of the various items carried under the following conditions are not subject to the provisions for this Class contained in this Annex and in Annex B, except as provided in paragraph (2) below:'

After 'A package shall not weigh more than 30 kg', insert the following subparagraph:

'These quantities contained in metal or plastics inner packagings may also be carried in shrink-wrapped or stretch-wrapped trays used as outer packagings provided that the total gross mass of the package does not exceed 20 kg.'

(2) Add a new paragraph (2) as follows:

'(2) For carriage in accordance with paragraph (1) above the description of the goods in the transport document shall conform to the requirements of marginal 2484 and include the words "limited quantity". Each package shall be clearly and durably marked with the identification number of the goods shown in the transport document, preceded by the letters "UN".'

(3) Add a new paragraph (3) as follows:

'(3) Batteries of 31°(b) installed in vehicles are not subject to the provisions of this Class contained in this Annex or in Annex B.'

2473 (1) The existing text becomes subparagraph (a).

Insert the following new subparagraph (b)

'(b) Chlorosilanes of 1° (a) may also be packed in combination packagings with metal, plastics or glass inner packagings conforming to marginal 3538. The inner packagings shall be hermetically closed and have a maximum capacity of 1 litre. A package shall not weigh more than 30 kg. The combination packagings shall be tested and approved in accordance with Appendix A.5 for packing group I.'

2473
(cont'd)

(4) Add a new paragraph as follows:

'(4) Substances referred to in paragraph (2) may also be packed in combination packagings conforming to marginal 3538 with hermetically closed glass inner packagings, with a capacity of not more than 1 litre, which shall be firmly secured individually in metal receptacles by means of cushioning materials. The glass receptacles shall not be filled to more than 90 % of their capacity. The following outer packagings shall be permitted: moveable head steel drums conforming to marginal 3520, boxes of natural wood conforming to marginal 3527, plywood boxes conforming to marginal 3528, reconstituted wood boxes conforming to marginal 3529, or steel or aluminum boxes conforming to marginal 3532.

These combination packagings shall be tested and approved in accordance with Appendix A.5 for packing group I.

A package shall not contain more than 30 litres of substances.'

(5) Add a new paragraph as follows:

'(5) (a) Cells of 31°(b) shall be placed in suitable outer packagings with 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 during carriage. Suitable outer packagings are metal drums (1A2, 1B2), plywood drums (1D), fibre drums (1G), plastics drums (1H2), metal boxes (4A, 4B), wooden boxes (4C, 4D, 4F), fibreboard boxes (4G) and plastics boxes (4H2). Such packagings shall conform to a design type that has been tested and approved in accordance with Appendix A.5 for packing group II solids.

(b) Batteries of 31° (b) may be carried unpacked or in protective enclosures (eg. in fully enclosed or wooden slatted crates) that are not subject to the packaging testing and approval requirements of Appendix A.5.'

2474 (1) and (2) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.

2475 (1) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.

2476 (1) (c) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.

2481 (5) 'Delete '2001 (7)'.

2482 (2) Amend the beginning to read:

'Packages containing substances and articles of this Class...'

(8) Delete.

Renumber (9) as (8).

2492 Replace all references to item 31° with references to item 41°.

CLASS 5.1

OXIDIZING SUBSTANCES

2500 (4) Amend the first sentence to read as follows:

'Oxidizing substances not specifically named may be assigned to Class 5.1 either on the basis of experience, or in accordance with the test method, procedure and criteria set out in the Manual of Tests and Criteria, Part III, section 34.4.'

Delete the last sentence.

2500 (5) Amend to read:

(cont'd)

'When solid substances not specifically named are assigned to the items of marginal 2501 on the basis of the test procedure in accordance with the Manual of Tests and Criteria, Part III, sub-section 34.4.1, the following criteria apply:

- A solid substance shall be assigned to Class 5.1 if, in the 4:1 or the 1:1 sample-to-cellulose ratio (by mass) tested, it ignites or burns or exhibits mean burning times greater than that of a 3:7 mixture (by mass) of potassium bromate and cellulose;
- A solid substance shall be assigned to letter (a) when in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, it exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose;
- A solid substance shall be assigned to letter (b), when, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, it 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 letter (a) are not met;
- A solid substance shall be assigned to letter (c), when in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, it 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 letters (a) and (b) are not met.'

(6) Amend to read:

'When liquid substances not specifically named are assigned to the items of marginal 2501 on the basis of the test procedure in accordance with the Manual of Tests and Criteria, Part III, sub-section 3.4.4.2, the following criteria apply:

- A liquid substance shall be assigned to Class 5.1 if, in the 1:1 mixture, by mass, of substance and cellulose tested, it exhibits a pressure rise of 2070 kPa gauge or more and a mean pressure rise time equal to or less than the mean pressure rise time of a 1:1 mixture, by mass, of 65 % aqueous nitric acid and cellulose;
- A liquid substance shall be assigned to letter (a) when, in the 1:1 mixture, by mass, of substance and cellulose tested, it 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;
- A liquid substance shall be assigned to letter (b) when, in the 1:1 mixture, by mass, of substance and cellulose tested, it 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 letter (a) are not met;
- A liquid substance shall be assigned to letter (c) when in the 1:1 mixture, by mass, of substance and cellulose tested, it 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 letters (a) and (b) are not met.'

(8) Amend to read:

'When substances are specifically named under more than one letter of the same item of marginal 2501, the relevant letter may be determined on the basis of the results of the test procedures in accordance with the Manual of Tests and Criteria, Part III, section 34.4 and the criteria set out in paragraphs (5) and (6).'

(9) Amend to read:

'On the basis of the test procedure in accordance with the Manual of Tests and Criteria, Part III, section 34.4, and the criteria set out in paragraphs (5) and (6), it may also be determined whether the nature of a specifically named substance is such that the substance is not subject to the provisions for this Class (see marginal 2514).'

- 2501 1° (b) In the note, replace '[see Appendix A.1, marginal 3106 (2) (g)]' with '[see Manual of Tests and Criteria, Part II, paragraph 20.4.3 (g)]'.
- Amend footnote (1) to read: 'See Manual of Tests and Criteria, Part II, section 20'.
- 11° At the end, add:
- '(c) 2427 *potassium chlorate, aqueous solution*, 2428 *sodium chlorate, aqueous solution*, 2429 *calcium chlorate, aqueous solution*, 3210 *chlorates, inorganic, aqueous solution, n.o.s.*'
- 11° Note 2, 14° note 2, 16° note 1, 17° note 1, 23°(c) note 1
- Insert 'and its aqueous solutions' respectively after 'ammonium chlorate', 'ammonium chlorite', 'ammonium bromate', 'ammonium permanganate', and 'ammonium nitrite'.
- 13° At the end, add: '(c) 3211 *perchlorates, inorganic, aqueous solution, n.o.s.*'
- 19° Delete this item.
- 21° Amend the footnote to 21° to read:
- 'Fertilizers containing ammonium nitrate which are assigned to identification number 2071 in the Recommendations on the Transport of Dangerous Goods are not subject to the provisions of this Directive, see marginal 2900. Fertilizers containing ammonium nitrate which are assigned to identification number 2072 in the Recommendations on the Transport of Dangerous Goods shall not be accepted for carriage.'
- 22° Add the following note 3:
- 'Note 3: Aqueous solutions of inorganic solid nitrates for which the concentration at the minimum temperature encountered in carriage is not greater than 80 % of the saturation limit are not subject to the provisions of this Directive.'
- 28° Insert the following entry: '(a) 3139 *oxidizing liquid, n.o.s.*'
- 41° Add the following note:
- 'Note: Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), which have contained substances of this Class are not subject to the conditions of this Directive if adequate measures have been taken to nullify any hazard. Hazards are nullified if adequate measures have been taken to nullify all hazards of Classes 1 to 9.'
- 2501a The existing text becomes 2501a (1) with the first sentence amended to read as follows:
- 'Substances of the various items, carried in conformity with the following provisions, are subject neither to the provisions for this Class, contained in this Annex nor to those contained in Annex B, except as provided for in paragraph (2) below.'
- After the words 'A package shall not weigh more than 39 kg', insert the following sub-paragraph:
- 'These quantities contained in metal or plastics inner packagings may also be carried in shrink-wrapped or stretch-wrapped trays used as outer packagings provided that the total gross mass of the package does not exceed 20 kg.'
- (2) Add a new paragraph (2) as follows:
- '(2) For carriage in accordance with paragraph (1) above the description of the goods in the transport document shall conform to the requirements of marginal 2514 and include the words "limited quantity".
- Each package shall be clearly and durably marked with the identification number of the goods shown in the transport document, preceded by the letters "UN".'
- 2504 (a) In the first sentence amend the reference 'marginals 2211 and 2213 (1) and (2)' to read 'marginals 2212 and 2213'.
- In the last sentence amend the reference 'marginals 2215 and 2216' to read 'marginals 2215 to 2217'.

- 2506 (1) and (3) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.
- 2507 (1) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.
Note: Replace 3560 by 3561.
- 2508 (1) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.
Note: Replace 3560 by 3561.
- 2511 (5) Delete '2001 (7)'.
- 2512 (4) Delete. Renumber (5) as (4).

CLASS 5.2

ORGANIC PEROXIDES

- 2550 (3) For '[see Appendix A.1, marginal 3104 (2) (a)]' read '[see Manual of Tests and Criteria, Part II, paragraph 20.4.3 (a)]'.
- (6) For 'in Appendix A.1, marginal 3104', read 'in the Manual of Tests and Criteria, Part II'.
- (9) Change OP2A or OP2B to OP2.
- (11) Replace the text after '...flashpoint of not less than 5 °C.' with the following text:
 'Type B diluents may be used for desensitization of all organic peroxides provided that the boiling point of the liquid is at least 60 °C higher than the SADT in a 50 kg package.'
- (12) Delete current text, insert following text:
 'Diluents, other than type A or type B, may be added to organic peroxide formulations as listed in marginal 2551 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 Division 5.2.'
- (17) For 'in Appendix A.1, marginal 3103', read 'in the Manual of Tests and Criteria, Part II, sections 20 and 28.4'.
- (18) Delete 'violent or' in text '— organic peroxide type D, showing a violent or medium effect ...'
- In the note, for 'in Appendix A.1, marginal 3103', read 'in the Manual of Tests and Criteria, Part II, sections 20 and 28.4'.
- 2551 *General:* Tables 1° to 19°: change OP*A or OP*B to OP*
- In the footnotes, change references to 'Appendix A.1, marginal 3104 (2)' ((d), (e) or (f)) as the case may be) to references to 'the Manual of Tests and Criteria, Part II, paragraph 20.4.3' (d), (e) or (f), as appropriate.
- In the changes for the individual substances only those columns of the tables are reflected where there is a change.
- 1° b) 3101 changes:
- from *tert-Butyl peroxyacetate* 53 — 77
 to *tert-Butyl peroxyacetate* > 52 — 77

2551 (cont'd)	from	1,1-Di-(<i>tert</i> -butylperoxy)-3,5,5-trimethylcyclohexane > 58 — 100
	to	1,1-Di-(<i>tert</i> -butylperoxy)-3,5,5-trimethylcyclohexane > 90 — 100
	from	1,1-Di-(<i>tert</i> -butylperoxy)cyclohexane 81 — 100
	to	1,1-Di-(<i>tert</i> -butylperoxy)cyclohexane > 80 — 100
	2° (b)	3102 changes:
	from	<i>tert</i> -Butyl monoperoxymaleate 53 — 100
	to	<i>tert</i> -Butyl monoperoxymaleate > 52 — 100
	from	3-Chloroperoxybenzoic acid 58 — 86
	to	3-Chloroperoxybenzoic acid > 57 — 86
	from	Dibenzoyl peroxide 52 — 100
	to	Dibenzoyl peroxide > 51 — 100
	from	Dibenzoyl peroxide 78 — 94
	to	Dibenzoyl peroxide > 77 — 94
	from	2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane 83 — 100
	to	2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane > 82 — 100
	from	3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane 53 — 100
	to	3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane > 52 — 100
	from	Di-(2-phenoxyethyl)peroxydicarbonate 86 — 100
	to	Di-(2-phenoxyethyl)peroxydicarbonate > 85 — 100
	from	Disuccinic acid peroxide ⁽¹⁾ 73 — 100
	to	Disuccinic acid peroxide ⁽¹⁾ > 72 — 100
	3° (b)	3103 changes:
	from	<i>n</i> -Butyl-4,4-di-(<i>tert</i> -butylperoxy)valerate 53 — 100
	to	<i>n</i> -Butyl-4,4-di-(<i>tert</i> -butylperoxy)valerate > 52 — 100
	from	<i>tert</i> -Butyl hydroperoxide > 73 — 90
	to	<i>tert</i> -Butyl hydroperoxide > 79 — 90
	from	<i>tert</i> -Butyl peroxyacetate ≤ 52
	to	<i>tert</i> -Butyl peroxyacetate > 32 — 52
	from	<i>tert</i> -Butyl peroxybenzoate 78 — 100
	to	<i>tert</i> -Butyl peroxybenzoate > 77 — 100
	from	1,1-Di-(<i>tert</i> -butylperoxy)cyclohexane 53 — 80
	to	1,1-Di-(<i>tert</i> -butylperoxy)cyclohexane > 52 — 80
	from	2,5-Dimethyl-2,5-di-(<i>tert</i> -butylperoxy)hexyne-3 53 — 100
	to	2,5-Dimethyl-2,5-di-(<i>tert</i> -butylperoxy)hexyne-3 ⁽¹⁾ > 52 — 86, ≥ 14, diluent type A
Add a new footnote ⁽¹⁾ to read: 'With < 0.5 % hydroperoxides content.'		
Renumber existing footnote ⁽¹⁾ to ⁽²⁾ .		
	from	Ethyl 3,3-di-(<i>tert</i> -butylperoxy)butyrate 78 — 100
	to	Ethyl 3,3-di-(<i>tert</i> -butylperoxy)butyrate > 77 — 100
to be added:		
<i>tert</i> -Butyl peroxy-2-methylbenzoate ≤ 100, OP5		
1,1-Di-(<i>tert</i> -amylperoxy)cyclohexane ≤ 82, ≥ 18 diluent type A, OP6		
1,1-Di-(<i>tert</i> -butylperoxy)-3,5,5-trimethylcyclohexane > 57 — 90, ≥ 10 diluent type A, OP5		

- 2551
(cont'd) 5° b) 3105 changes: (general packing method: OP7)
- from 2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane 53 — 100
to 2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane > 52 — 100
- from tert-Butyl cumylperoxide ≤ 100
to tert-Butyl cumylperoxide > 42 — 100
- from tert-Butyl peroxybenzoate 52 — 77
to tert-Butyl peroxybenzoate > 52 — 77
- from tert-Butyl peroxy-3,5,5-trimethylhexanoate ≤ 100
to tert-Butyl peroxy-3,5,5-trimethylhexanoate > 32 — 100
- from 1,1-Di-(tert-butylperoxy)cyclohexane ≤ 52
to 1,1-Di-(tert-butylperoxy)cyclohexane > 42 — 52
- from Di-(tert-butylperoxy)-phthalate 43 — 52
to Di-(tert-butylperoxy)-phthalate > 42 — 52
- from p-Menthyl hydroperoxide 56 — 100
to p-Menthyl hydroperoxide > 72 — 100

To be added: (general packing method OP7)

tert-Amyl peroxy-2-ethylhexyl carbonate ≤ 100

1-(2-tert-Butylperoxy isopropyl)-3-isopropenylbenzene ≤ 77, ≥ 23 diluent A

Di-tert-butyl peroxyazelaate ≤ 52, ≥ 48 diluent type A

tert-Butyl peroxy-2-ethylhexylcarbonate ≤ 100

tert-Butyl peroxybutyl fumarate ≤ 52, ≥ 48 diluent type A

- 6° (b) 3106 changes: (general packing method OP7)

from Dibenzoyl peroxide 36 — 52
to Dibenzoyl peroxide > 35 — 52

from Dibenzoyl peroxide⁽¹⁾ 53 — 62 (as a paste)
to Dibenzoyl peroxide⁽¹⁾ > 52 — 62 (as a paste)

from Di-[2-tert-butylperoxyisopropyl]benzene(s) 43 — 100
to Di-[2-tert-butylperoxyisopropyl]benzene(s) > 42 — 100

to be added: (general packing method OP7)

3-Chloroperoxybenzoic acid ≤ 77, ≥ 6 inert solid, ≥ 17 water

Di-(4-methylbenzoyl) peroxide as a paste, ≤ 52

Di-isopropylbenzene dihydroperoxide⁽³⁾ ≤ 82, ≥ 5 diluent type A, ≥ 5 water

tert-Butyl cumyl peroxide ≤ 42, ≥ 58 inert solid

Add a new footnote ⁽³⁾ to read:

‘⁽³⁾ With ≤ 8 % 1-isopropylhydroperoxy-4-isopropylhydroxybenzene.’

- 7° (b) 3107 changes: (general packing method OP8)

from Di-tert-butyl peroxide ≤ 100
to Di-tert-butyl peroxide > 32 — 100

to be added: (general packing method OP8)

2551

(cont'd)

Insert a new column 'Diluent Type B (%)'

tert-Amyl peroxyacetate ≤ 62 , ≥ 38 diluent type A*tert*-Butyl hydroperoxide ⁽¹⁾ ≤ 79 , 14 water, figure 8 in the column 'additional labelling'*Cumyl hydroperoxide* $> 90 - 98 \leq 10$ diluent type A with figure 8 in the column 'Additional labelling'.*Dibenzoyl peroxide* $> 36 - 42$, ≥ 18 diluent type A ≤ 40 water*Dibenzoyl peroxide* $> 36 - 42$, ≥ 58 diluent type A1,1-Di-(*tert*-butylperoxy)-3,5,5-trimethylcyclohexane ≤ 32 , ≥ 26 diluent type A, ≥ 42 % diluent type BAdd a new footnote ⁽¹⁾ to read: '⁽¹⁾ With < 6 % di-*tert*-butyl peroxide.'Renumber footnotes ⁽¹⁾, ⁽²⁾ and ⁽³⁾ to ⁽²⁾, ⁽³⁾ and ⁽⁴⁾.

8° (b) 3108 changes: (general packing method OP8)

from *tert*-Butyl monoperoxymaleate ⁽¹⁾ as a paste ≤ 42 to *tert*-Butyl monoperoxymaleate ⁽¹⁾ as a paste ≤ 52

to be added: (general packing method OP8)

tert-Butyl monoperoxymaleate ≤ 52 , ≥ 48 inert solid*n*-Butyl-4,4-di-(*tert*-butylperoxy)valerate ≤ 42 , ≥ 58 inert solid1-(2-*tert*-Butylperoxy isopropyl)-3-isopropenylbenzene ≤ 42 , ≥ 58 inert solid*Dibenzoyl peroxide* ≤ 56.5 % as a paste, ≥ 15 % water2,5-Dimethyl-2,5-di-(*tert*-butylperoxy)hexane as a paste, ≤ 47

Add a new column 'Inert solid (%)'

9° (b) 3109 changes (general packing method OP8)

from *p*-Menthyl hydroperoxide ≤ 55 , ≥ 45 diluent type Ato *p*-Menthyl hydroperoxide ≤ 72 , ≥ 28 diluent type Afrom *Pinanyl hydroperoxide* ≤ 55 , ≥ 45 diluent type Ato *Pinanyl hydroperoxide* ≤ 56 , ≥ 44 diluent type A

to be added: (general packing method OP8)

Insert a new column 'Diluent Type B (%)'

tert-Butyl peroxy-3,5,5-Trimethylhexanoate ≤ 32 , ≥ 68 diluent type A*tert*-Butyl peroxyacetate ⁽¹⁾ ≤ 22 , ≥ 78 diluent type B*tert*-Butyl peroxyacetate ≤ 32 , ≥ 68 diluent type A*Dibenzoyl peroxide* as a stable dispersion in water ≤ 42 Di-*tert*-butyl peroxide ⁽²⁾ ≤ 32 , ≥ 68 diluent type B1,1-Di-(*tert*-butylperoxy) cyclohexane ≤ 42 , ≥ 58 diluent type A1,1-Di-(*tert*-butylperoxy) cyclohexane ≤ 13 , ≥ 13 diluent type A, ≥ 74 diluent type B2,5-Dimethyl-2,5-di-(*tert*-butylperoxy)hexane ≤ 52 , ≥ 48 diluent type ARenumber existing footnote ⁽¹⁾ to ⁽²⁾ and add a new footnote ⁽¹⁾ to read: '⁽¹⁾ Diluent type B with boiling point $> 110^{\circ}\text{C}$.'

10° (b) 3110 changes:

from *Dicumyl peroxide* 43 — 100to *Dicumyl peroxide* $> 42 - 100$

2551
(cont'd)

11° b) 3111 changes:

from *tert*-Butyl peroxyisobutyrate 53 — 77
to *tert*-Butyl peroxyisobutyrate > 52 — 77

from Diisobutyryl peroxide 33 — 52
to Diisobutyryl peroxide > 32 — 52

to be added:

Isopropyl sec-butyl peroxydicarbonate

+*Di-sec-butyl peroxydicarbonate*

+*Di-isopropyl peroxydicarbonate* ≤ 52 + ≤ 28 + ≤ 22, OP5, Tc – 20 °C, Te – 10 °C

12° (b) 3112 changes:

from Dicyclohexyl peroxydicarbonate 92 — 100
to Dicyclohexyl peroxydicarbonate > 91 — 100

from Diisopropyl peroxydicarbonate 53 — 100
to Diisopropyl peroxydicarbonate > 52 — 100

13° (b) 3113 changes:

from *tert*-Butyl peroxy-2-ethylhexanoate 53 — 100
to *tert*-Butyl peroxy-2-ethylhexanoate > 52 — 100

from *tert*-Butyl peroxy-pivalate 68 — 77
to *tert*-Butyl peroxy-pivalate > 67 — 77

from *Di-sec-butyl peroxydicarbonate* 52 — 100
to *Di-sec-butyl peroxydicarbonate* > 52 — 100

from *Di*-(2-ethylhexyl) peroxydicarbonate 78 — 100
to *Di*-(2-ethylhexyl) peroxydicarbonate > 77 — 100

15° (b) 3115 changes: (general packing method OP7)

from *tert*-Butyl peroxyneodecanoate 78 — 100
to *tert*-Butyl peroxyneodecanoate > 77 — 100

from *tert*-Butyl peroxy-pivalate ≤ 67
to *tert*-Butyl peroxy-pivalate > 27 — 67, ≥ 33 diluent type B

from *Di-n-butyl peroxydicarbonate* 28 — 52
to *Di-n-butyl peroxydicarbonate* > 27 — 52

from *Di*-(3,5,5-trimethylhexanoyl) peroxide ≤ 82
to *Di*-(3,5,5-trimethylhexanoyl) peroxide > 38 — 82

to be added:

2,4,4-Trimethylpentyl-2-peroxyneodecanoate ≤ 72, ≥ 28 diluent type A, Tc – 5 °C, Te + 5 °C

Cumyl peroxyneohexanoate ≤ 77, ≥ 23 diluent type A⁽³⁾, Tc – 10 °C, Te 0 °C

Di-(2-Neodecanoylperoxyisopropyl)benzene ≤ 52, ≥ 48 diluent type A⁽³⁾, Tc – 10 °C, Te 0 °C

tert-Butyl peroxyneohexanoate ≤ 77, ≥ 23 diluent type A⁽³⁾, Tc + 5 °C, Te + 10 °C

Add a new footnote (3): 'Only diluent type A shall be used.'

16° (b) 3116 changes:

from Diperoxy dodecane diacid 14 — 42
to Diperoxy dodecane diacid > 13 — 42

2551
(cont'd)

17° b) 3317 changes: (general packing method OP8)

from *tert-Butyl peroxy-2-ethylhexanoate* ≤ 52 , ≥ 48 diluent type A/B, Tc 20 °C, Te 25 °C
to *tert-Butyl peroxy-2-ethylhexanoate* $> 32 - 52$, ≥ 48 diluent type B Tc +30 °C, Te +35 °C

to be added:

tert-Butyl peroxyneodecanoate as a stable dispersion in water ≤ 42 , Tc 0 °C, Te +10 °C

Di-(3,5,5-trimethylhexanoyl) peroxide as a stable dispersion in water ≤ 52 , Tc +10 °C, Te +15 °C

1,1-Dimethyl-3-hydroxybutylperoxyneohexanoate ≤ 52 , ≥ 48 diluent type A*, Tc 0 °C, Te +10 °C

Add a new footnote: '(*) Only diluent type A shall be used.'

Delete:

Di-(2-ethylhexyl) peroxydicarbonate as a stable dispersion in water, ≤ 42

18° (b) 3118 no changes (general packing method OP8)

to be added:

tert-Butyl peroxyneodecanoate as a stable dispersion in water (frozen) ≤ 42 , Tc 0 °C, Te +10 °C

Di-n-butyl peroxydicarbonate as a stable dispersion in water (frozen) ≤ 42 , Tc - 15 °C, Te - 5

tert-Butyl peroxy-2-ethylhexanoate ≤ 52 , ≥ 48 inert solid, Tc +20 °C, Te +25 °C

Insert a new column 'Inert solid (%)'.

19° (b) 3119 no changes: (general packing method OP8)

to be added:

2,4,4-Trimethylpentyl-2-peroxyneodecanoate as a stable dispersion in water ≤ 52 , Tc - 5 °C, Te +5 °C

Cumyl peroxyneodecanoate as a stable dispersion in water ≤ 52 , Tc - 10 °C, Te 0 °C

Di-(2-ethylhexyl) peroxydicarbonate as a stable dispersion in water ≤ 52 , Tc - 15 °C, Te - 5 °C

Di-(3,5,5-trimethylhexanoyl) peroxide ≤ 38 , ≥ 62 diluent type A, Tc +20 °C, Te +25 °C

tert-Butyl peroxy-2-ethylhexanoate ≤ 32 , ≥ 68 diluent type B, Tc +40 °C, Te +45 °C

tert-Butyl peroxy-pivalate ≤ 27 , ≥ 73 diluent type B, Tc +30 °C, Te +35 °C

Insert two new columns 'Diluent type A (%)' and 'Diluent type B (%)'.

2551a The existing text becomes 2551a (1)

Amend the first sentence and sub-paragraphs (a) and (b) to read as follows:

'Substances and articles of 1° to 10°, carried in conformity with the following provisions, are not subject to the provisions for this Class contained in this Annex or in Annex B, except as provided for in paragraph (2) below:

- (a) liquids of 1° and 3°: not more than 25 ml per inner packaging;
- (b) solids of 2° and 4°: not more than 100 g per inner packaging;
- (c) liquids of 5°, 7° and 9°; not more than 125 ml per inner packaging;
- (d) solids of 6°, 8° and 10°; not more than 500 g per inner packaging.'

After the text 'the total gross mass of the package shall not exceed 30 kg', insert a new sentence to read:

'These quantities contained in metal or plastic inner packagings may also be carried in shrink-wrapped or stretch-wrapped trays as outer packagings, provided that the total gross mass of the package does not exceed 20 kg.'

2551a (2) Add a new paragraph (2) as follows:
(*cont'd*)

'(2) For carriage in accordance with paragraph (1) above, the description of the goods in the transport document shall conform to the requirements of marginal 2561 and include the words "limited quantity". Each package shall be clearly and durably marked with the identification number of the goods shown in the transport document, preceded by the letters "UN".'

2553 (1) Amend the first sentence to read as follows:

'The packing methods for substances of Class 5.2 are listed in Table 2 and are designated OP1 to OP8.'

(second sentence unchanged)

(2) Replace paragraph with the following text:

'Substances and articles shall be packed as indicated in marginal 2551 and as set out in detail in Table 2. A packing method corresponding to a smaller package size (i.e. with a lower OP number) may be used but a packing method corresponding to a larger package size (i.e. with a higher OP number) shall not be used.'

The quantities specified for each packing method represent the maximum that is currently considered good practice. The following kind of packagings may be used:

- drums conforming to marginals 3520, 3521, 3523, 3525 or 3526; or
- jerricans conforming to marginals 3522 or 3526; or
- boxes conforming to marginals 3527, 3528, 3529, 3530, 3531 or 3532; or
- composite packagings with plastic inner receptacle, conforming to marginal 3537

provided that:

- (a) the provisions of Appendix A.5 are complied with;
- (b) metal packagings (including inner packagings of combination packagings and outer packagings of combination or composite packagings) are used only for packing methods OP7 and OP8;
- (c) in combination packagings, glass receptacles are used only as inner packagings with a maximum content of 0.5 kg or 0.5 litre.

TABLE 2

Maximum quantity per packaging/Package ^(a) for packing methods OP1 to OP8

Packing method Maximum quantity	OP1	OP2 ^(a)	OP3	OP4 ^(a)	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	200 ^(b)
Maximum contents in litres for liquids ^(c)	0,5	—	5	—	30	60	60	225 ^(d)

^(a) 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.

^(b) 60 kg for jerricans
100 kg for boxes

^(c) Viscous liquids should be treated as solids if the criterion of marginal 2553 (1) is met.

^(d) 60 litres for jerricans

2554 Delete paragraph number '(1)'.

(a) — (e) Change 'OP*A or OP*B' to 'OP*'

In (a) and (b) replace the references to Appendix A.1, marginal 3104 (2) (b) and 3104 (2) (c) with references to 'the Manual of Tests and Criteria, Part II, paragraphs 20.4.3 (b) and (c) respectively'.

Delete paragraphs (2) and (3) and Tables 2(A) and 2(B).

2555 (1) Replace the reference to Appendix A.1, marginal 3104 (2) (f) with a reference to the Manual of Tests and Criteria, Part II, paragraph 20.4.3 (f).

(2) Table should be read as follows:

Substance	Type of IBC	Maximum capacity (litres)	Control temperature	Emergency temperature
3109 Organic peroxide, type F, liquid				
tert-Butyl peroxyacetate, not more than 32 % in diluent type A	31A 31HA1	1 250 1 000		
tert-Butyl peroxy-3,5,5-trimethylhexanoate, not more than 32 % in diluent type A	31A 31HA1	1 250 1 000		
Cumyl hydroperoxide, not more than 90 % in diluent type A	31HA1	1 250		
Dibenzoyl peroxide, not more than 42 % as a stable dispersion	31H1	1 000		
Di-tert-butyl peroxide, not more than 32 % in diluent type A	31A 31HA1	1 250 1 000		
1,1-Di-(tert-butylperoxy) cyclohexane, not more than 42 % in diluent type A	31H1	1 000		
Dilauroyl peroxide, not more than 42 %, stable dispersion, in water	31HA1	1 000		
Isopropyl cumyl hydroperoxide, not more than 72 % in diluent type A	31HA1	1 250		
p-Methyl hydroperoxide, not more than 72 % in diluent type A	31HA1	1 250		
Peroxyacetic acid, stabilized, not more than 17 %	31H1	1 000		
3119 Organic peroxide, type F, liquid, temperature controlled				
tert-Butyl peroxy-2-ethylhexanoate, not more than 32 % in diluent type B	31HA1 31A	1 000 1 250	+30 °C +30 °C	+35 °C +35 °C
tert-Butyl peroxy-pivalate, not more than 27 % in diluent type B	31HA1 31A	1 000 1 250	+10 °C +10 °C	+15 °C +15 °C
Di-(4-tert-butylcyclohexyl) peroxydicarbonate, not more than 42 %, stable dispersion, in water	31HA1	1 000	+30 °C	+35 °C
Dicetyl peroxydicarbonate, not more than 42 %, stable dispersion, in water	31HA1	1 000	+30 °C	+35 °C
Dimyristyl peroxydicarbonate, not more than 42 %, stable dispersion, in water	31HA1	1 000	+15 °C	+25 °C
Di-(3,5,5-trimethylhexanoyl) peroxide, not more than 38 % in diluent type A	31HA1 31A	1 000 1 250	+10 °C +10 °C	+15 °C +15 °C
3120 Organic peroxide, type F, solid, temperature controlled				

2559 Delete paragraph (4).

Renumber paragraphs (1)-(3) under the heading 'Danger labels' as paragraphs (2)-(4).

- 2561 (5) Replace '[see Appendix A.1, marginal 3104(2)(g)]' with '[see Manual of Tests and Criteria, Part II, paragraph 20.4.2 (g)]'.

CLASS 6.1

TOXIC SUBSTANCES

- 2600 (2) In A, delete 'which are not substances of Class 3'.
- (3) 2. In the table, replace the reference to footnote '(1)' and the existing footnote '(1)' by '(2)'. Insert a reference to a new footnote '(1)' in the headings of the third and fourth columns [e.g., the heading of the third column will be 'Oral toxicity LD₅₀ (mg/kg) (1)'] and insert a new footnote '(1)', as follows:

'(1) LD₅₀ toxicity data for a number of common pesticides may be obtained from the most current edition of the document *The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification* available from the International Programme on Chemical Safety, World Health Organization (WHO), CH-1211 Geneva 27, Switzerland. While that document may be used as a source of LD₅₀ data for pesticides, its classification system should not be used for purposes of transport classification of, or assignment of packing groups to, pesticides, which should be in accordance with the provisions of this Directive.'

2.5 Second sentence, replace as follows:

'A solid substance should be tested if at least 10 % of its total mass is likely to be dust in a respirable range, e.g. the aerodynamic diameter of that particle-fraction is 10 µm or less. A liquid substance should be tested if a mist is likely to be generated in a leakage of the transport containment. Both for solid and liquid substances more than 90 % (by mass) of a specimen prepared for inhalation toxicity should be in the respirable range as defined above.'

- (3) Add at the end:

'Methods for determining oral and dermal toxicity of mixtures

5. When classifying and assigning the appropriate packing group to mixtures in Division 6.1 in accordance with the oral and dermal toxicity criteria (2.3 and 2.4 above), it is necessary to determine the acute LD₅₀ of the mixture.

- 5.1. If a mixture contains only one active substance, and the LD₅₀ of that constituent is known, in the absence of reliable acute oral and dermal toxicity data on the actual mixture to be transported, the oral or dermal LD₅₀ may be obtained by the following method:

$$\text{LD}_{50} \text{ value of preparation} = \frac{\text{LD}_{50} \text{ value of active substance} \times 100}{\text{percentage of active substance by mass}}$$

- 5.2. If a mixture contains more than one active constituent, there are three possible approaches that may be used to determine the oral or dermal LD₅₀ of the mixture. The preferred method is to obtain reliable acute oral and dermal toxicity data on the actual mixture to be transported. If reliable, accurate data is not available, then either of the following methods may be performed:

- (a) Classify the formulation according to the most hazardous constituent of the mixture as if that constituent were present in the same concentration as the total concentration of all active constituents; or

2600
(cont'd)

(b) Apply the formula:

$$\frac{C_A}{T_A} + \frac{C_B}{T_B} + \frac{C_Z}{T_Z} = \frac{100}{T_M}$$

where:

C = the percentage concentration of constituent A, B, ... Z in the mixture

T = the oral LD₅₀ values of constituent A, B, ... Z

T_M = the oral LD₅₀ value of the mixture

Note: This formula can also be used for dermal toxicities provided that this information is available on the same species for all constituents. The use of this formula does not take into account any potentiation or protective phenomena.'

(6) Amend to read:

'Highly toxic or toxic flammable liquids having a flashpoint below 23 °C — excluding substances which are highly toxic on inhalation of 1° to 10° — are substances of Class 3 (see marginal 2301, 11° to 19°).'

2601 In A in the title, delete 'which are not substances of Class 3'.

1° Identification numbers 1051 and 1614, for 'containing not more than 3 % water' read 'containing less than 3 % water'.

8° (a) Present text, number as 2. Insert:

'1. 1251 *methyl vinyl ketone, stabilized*'.

9° Read:

'Liquids as well as solutions and mixtures (such as preparations and wastes) which are highly toxic on inhalation, having a flashpoint below 23 °C which cannot be classified under another entry of 1° to 8°:

(a) 1239 *methyl chloromethyl ether*

3279 *organophosphorous compound, toxic, flammable, n.o.s.*

2929 *toxic liquid, flammable, organic, n.o.s.*'

10° (a) Add '1695 *chloroacetone, stabilized*'.

In the note under the title B, replace '71° to 78° and 81° to 87°' by '71° to 73°'.

11° (b) Present text number as 2.

Delete entry 3073.

Insert: '1. 3073 *vinylpyridines, inhibited*'.

12° (b) Amend entry 2522 to read:

'2522 *2-dimethylaminoethyl methacrylate*'.

Add:

'2542 *tributylamine*'

'3302 *2-dimethylaminoethyl acrylate*'.

13° Add (b) '1199 *furaldehydes*'.

14° (c) Delete entries 2369 and 2938.

2601
(cont'd)

15° (a) Add: '2644 *methyl iodide*'.

Delete the note.

(b) Delete entry 2644.

(c) Amend the note to read:

'1912 methyl chloride and methylene chloride mixture is a substance of Class 2 (see marginal 2201, 2°F).'

16° (a) Insert entry '2295 *methyl chloroacetate*'

(b) Delete entry 2295.

17° (a), (b) and (c): Delete entry 1610.

(a) Amend the note to read:

'1581 chloropicrin and methyl bromide mixture and 1582 chloropicrin and methyl chloride mixture are substances of Class 2 (see marginal 2201, 2°T).'

(b) Delete entry 1695.

(c) Delete entry 3241.

18° Add: '(a) 2487 *phenyl isocyanate*
2488 *cyclohexyl isocyanate*'.

(b) Delete entries 2487 and 2488.

19° (c) Delete entry 2489.

20° (a) Insert the following entries:

'3023 *2-methyl-2-heptanethiol*'.

'2477 *methyl isothiocyante*'.

(b) Delete entries 2477 and 3023.

In the note under the title C, replace '75° and 76°' by '71° to 73°'.

51° (a), (b) and (c)

In entries 1556 and 1557, insert ', inorganic' after '*n.o.s.*'.

51° Note

52° Note 1

53° Note 1: Replace references to items '79°', '75°' and '85°' by references to '71° to 73°'.

55° (c) Delete entry 2658.

59° For identification number 1549, insert 'inorganic,' after 'compound'.

67° (a) Add '1809 *phosphorus trichloride*'.

F. Section F, replace as follows:

'F. Substances and preparations used as pesticides

71° Pesticides, liquid, toxic,

72° Pesticides, liquid, toxic, flammable,

73° Pesticides, solid, toxic.

In these items, substances and preparations used as pesticides must be classified under letters (a), (b) or (c) in conformity with the criteria of marginal 2600 (3) as follows:

(a) highly toxic substances and preparations,

(b) toxic substances and preparations,

2601
(cont'd)

(c) slightly toxic substances and preparations.

Note: 1. Flammable liquid substances and preparations, used as pesticides, which are highly toxic, toxic or slightly toxic and have a flashpoint below 23 °C, are substances of Class 3 (see marginal 2301, 41°).

2. (a) Articles impregnated with substances and preparations used as pesticides of 71° to 73°, such as fibreboard plates, paper strips, cotton-wool balls, sheets of plastics material, etc., in airtight, hermetically closed wrappings, are not subject to the provisions of this Directive.

(b) Substances such as baits and cereals impregnated with substances and preparations used as pesticides of 71° to 73° or other substances of Class 6.1 shall be classified according to their toxicity [see marginal 2600 (3)].

71° Pesticides, liquid, toxic:

2992 carbamate pesticide, liquid, toxic,
2994 arsenical pesticide, liquid, toxic,
2996 organochlorine pesticide, liquid, toxic,
2998 triazine pesticide, liquid, toxic,
3000 phenoxy pesticide, liquid, toxic,
3002 phenyl urea pesticide, liquid, toxic,
3004 benzoic derivative pesticide, liquid, toxic,
3006 dithiocarbamate pesticide, liquid, toxic,
3008 phthalimide derivative pesticide, liquid, toxic,
3010 copper based pesticide, liquid, toxic,
3012 mercury based pesticide, liquid, toxic,
3014 substituted nitrophenol pesticide, liquid, toxic,
3016 bipyridylium pesticide, liquid, toxic,
3018 organophosphorus pesticide, liquid, toxic,
3020 organotin pesticide, liquid, toxic,
3026 coumarin derivative pesticide, liquid, toxic,
2902 pesticide, liquid, toxic, n.o.s.

72° Pesticides, liquid, toxic, flammable:

2991 carbamate pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
2993 arsenical pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
2995 organochlorine pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
2997 triazine pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
2999 phenoxy pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3001 phenyl urea pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3003 benzoic derivative pesticide, liquid, toxic, flammable, flashpoint not less than 3 °C,
3005 dithiocarbamate pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3007 phthalimide derivative pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3009 copper based pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3011 mercury based pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3013 substituted nitrophenol pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3015 bipyridilium pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3017 organophosphorus pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
3019 organotin pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,

- 2601 (cont'd) 72° 3025 coumarin derivative pesticide, liquid, toxic, flammable, flashpoint not less than 23 °C,
2903 pesticide, liquid, toxic, flammable, n.o.s., flashpoint not less than 23 °C.

73° Pesticides, solid, toxic:

2757 carbamate pesticide, solid, toxic,
2759 arsenical pesticide, solid, toxic,
2761 organochlorine pesticide, solid, toxic,
2763 triazine pesticide, solid, toxic,
2765 phenoxy pesticide, solid, toxic,
2767 phenyl urea pesticide, solid, toxic,
2769 benzoic derivative pesticide, solid, toxic,
2771 dithiocarbamate pesticide, solid, toxic,
2773 phthalimide derivative pesticide, solid, toxic,
2775 copper based pesticide, solid, toxic,
2777 mercury based pesticide, solid, toxic,
2779 substituted nitrophenol pesticide, solid, toxic,
2781 bipyridilium pesticide, solid, toxic,
2783 organophosphorus pesticide, solid, toxic,
2786 organotin pesticide, solid, toxic,
3027 coumarin derivative pesticide, solid, toxic,
2588 pesticide, solid, toxic, n.o.s.

TABLE:

List of common pesticides with corresponding identification numbers

- Note: 1. The identification numbers provide a reference to the relevant names in marginal 2301, 41° or 2601, 71° to 73°.
2. The table contains a list of common pesticides and a reference to the identification numbers assigned to the names that are relevant to the generic chemical group (e.g., organophosphorus pesticide) to which the particular pesticide belongs. The description used in the transport of the pesticide shall include the name selected from those referenced on the basis of the active ingredient, of the physical state of the pesticide and any subsidiary risks it may exhibit, supplemented by the indication of the active ingredient.

Substance	Identification number
aldicarb	2757, 2758, 2991, 2992
aldrin	2761, 2762, 2995, 2996
alkaloids or alkaloid salts	2588, 2902, 2903, 3021
allidochlor	2761, 2762, 2995, 2996
aminocarb	2757, 2758, 2991, 2992
(*) ANTU	2588, 2902, 2903, 3021
(*) arsenic compounds	2759, 2760, 2993, 2994
azinphos-ethyl	2783, 2784, 3017, 3018
azinphos-methyl	2783, 2784, 3017, 3018
bendiocarb	2757, 2758, 2991, 2992
benfuracarb	2757, 2758, 2991, 2992
benquinox	2588, 2902, 2903, 3021
binapacryl	2779, 2780, 3013, 3014
(*) blasticidin-S-3	2588, 2902, 2903, 3021
(*) brodifacoum	3024, 3025, 3026, 3027
bromophos-ethyl	2783, 2784, 3017, 3018
(*) Not ISO common name.	

2601
(cont'd)

Substance	Identification number
bromoxynil	2588, 2902, 2903, 3021
butocarboxim	2757, 2758, 2991, 2992
camphechlor	2761, 2762, 2995, 2996
carbaryl	2757, 2758, 2991, 2992
carbofuran	2757, 2758, 2991, 2992
carbophenothion	2783, 2784, 3017, 3018
cartap, hydrochloride	2757, 2758, 2991, 2992
chinomethionat	2588, 2902, 2903, 3021
chlordane	2762, 2995, 2996
chlordimeform	2762, 2995, 2996
chlordimeform hydrochloride	2762, 2995, 2996
chlorfenvinphos	2783, 2784, 3017, 3018
chlormephos	2783, 2784, 3017, 3018
chlorophacinone	2761, 2762, 2995, 2996
chlorpyrifos	2783, 2784, 3017, 3018
chlorthiophos	2783, 2784, 3017, 3018
copper compounds	2775, 2776, 3009, 3010
coumachlor	3024, 3025, 3026, 3027
coumafuryl	3024, 3025, 3026
coumaphos	3024, 3025, 3026, 3027
coumatetralyl (racumin)	3024, 3025, 3026, 3027
crimidine	2761, 2762, 2995, 2996
crotoxyphos	2783, 2784, 3017, 3018
crufomate	2784, 3017, 3018
cyanazine	2763, 2764, 2997, 2998
cyanophos	2783, 2784, 3017, 3018
cycloheximide	2588, 2902, 2903, 3021
cyhexatin	2786, 2787, 3019, 3020
cypermethrin	2588, 2902, 2903, 3021
2,4-D	2766, 2999, 3000
dazomet	2902, 2903, 3021
(*) 2,4-DB	2766, 2999, 3000
(*) DDT	2761, 2762, 2995, 2996
(*) DEF	2784, 3017, 3018
(*) demephion	2783, 2784, 3017, 3018
(*) demeton	2783, 2784, 3017, 3018
(*) demeton-O (systox)	2783, 2784, 3017, 3018
demeton-O-methyl thiono isomer	2783, 2784, 3017, 3018
demeton-S-methyl	2783, 2784, 3017, 3018
(*) demeton-S-methyl sulphone	2783, 2784, 3017, 3018
dialifos	2783, 2784, 3017, 3018
di-allate	2588, 2902, 2903, 3021
diazinon	2783, 2784, 3017, 3018
(*) 1,2-dibromo-3-chloropropane	2761, 2762, 2995, 2996
dichlofenthion	2783, 2784, 3017, 3018
dichlorvos	2783, 2784, 3017, 3018

(*) Not ISO common name.

2601
(*cont'd*)

Substance	Identification number
(*) dicoumarol	3024, 3025, 3026, 3027
dicrotophos	2783, 2784, 3017, 3018
dieldrin	2761, 2762, 2995, 2996
(*) difenacoum	3024, 3025, 3026, 3027
difenzoquat	2902, 2903, 3021
dimefox	2783, 2784, 3017, 3018
(*) dimetan	2757, 2758, 2991, 2992
(*) dimethoate	2783, 2784, 3017, 3018
(*) dimetilan	2757, 2758, 2991, 2992
dimexano	2902, 2903, 3021
dinobuton	2779, 2780, 3013, 3014
dinoseb	2779, 2780, 3013, 3014
dinoseb acetate	2779, 2780, 3013, 3014
dinoterb	2779, 2780, 3013, 3014
dinoterb acetate	2779, 2780, 3013, 3014
dioxacarb	2757, 2758, 2991, 2992
dioxathion	2783, 2784, 3017, 3018
diphacinone	2588, 2902, 2903, 3021
diquat	2782, 3015, 3016
disulfoton	2783, 2784, 3017, 3018
DNOC	2779, 2780, 3013, 3014
drazoxolon	2588, 2902, 2903, 3021
edifenphos	2783, 2784, 3017, 3018
endosulfan	2761, 2762, 2995, 2996
endothal-sodium	2588, 2902, 2903, 3021
endothion	2783, 2784, 3017, 3018
endrin	2761, 2762, 2995, 2996
(*) EPN	2783, 2784, 3017, 3018
ethion	2783, 2784, 3017, 3018
ethoate-methyl	2783, 2784, 3017, 3018
ethoprophos	2783, 2784, 3017, 3018
fenaminosulf	2588, 2902, 2903, 3021
fenaminphos	2783, 2784, 3017, 3018
fenitrothion	2784, 3017, 3018
fenpropathrin	2588, 2902, 2903, 3021
fensulfothion	2783, 2784, 3017, 3018
fenthion	2783, 2784, 3017, 3018
fentin acetate	2786, 2787, 3019, 3020
fentin hydroxide	2786, 2787, 3019, 3020
(*) fluorine compounds	2588, 2902, 2903, 3021
(*) fluoroacetamide	2588, 2902, 2903, 3021
fonofos	2783, 2784, 3017, 3018
formetanate	2757, 2758, 2991, 2992
formothion	2784, 3017, 3018
heptachlor	2761, 2762, 2995, 2996
heptenophos	2783, 2784, 3017, 3018

(*) Not ISO common name.

2601
(cont'd)

Substance	Identification number
imazalil	2902, 2903, 3021
ioxynil	2588, 2902, 2903, 3021
iprobefos	2784, 3017, 3018
isobenzan	2761, 2762, 2995, 2996
(*) isodrin	2761, 2762, 2995, 2996
isofenphos	2783, 2784, 3017, 3018
(*) isolan	2757, 2758, 2991, 2992
isoprocab	2757, 2758, 2991, 2992
isothioate	2783, 2784, 3017, 3018
isoxathion	2783, 2784, 3017, 3018
(*) kelevan	2902, 2903, 3021
lindane (BHC)	2761, 2762, 2995, 2996
mecarbam	2783, 2784, 3017, 3018
medinoterb	2779, 2780, 3013, 3014
mephosfolan	2783, 2784, 3017, 3018
mercaptodimethur	2757, 2758, 2991, 2992
mercury (II) (mercuric) compounds	2777, 2778, 3011, 3012
mercury (I) (mercurous) compounds	2777, 2778, 3011, 3012
metam-sodium	2771, 2772, 3005, 3006
methamidophos	2783, 2784, 3017, 3018
methasulfocarb	2757, 2758, 2991, 2992
methidathion	2783, 2784, 3017, 3018
methomyl	2757, 2758, 2991, 2992
(*) methyltrithion	2783, 2784, 3017, 3018
mevinphos	2783, 2784, 3017, 3018
mexacarbate	2757, 2758, 2991, 2992
(*) mirex	2762, 2995, 2996
(*) mobam	2757, 2758, 2991, 2992
monocrotophos	2783, 2784, 3017, 3018
nabam or nabam preparations	2772, 3005, 3006
naled	2783, 2784, 3017, 3018
(*) nicotine compounds	2588, 2902, 2903, 3021
norbormide	2588, 2902, 2903, 3021
omethoate	2783, 2784, 3017, 3018
organotin pesticides	2786, 2787, 3019, 3020
(*) oxamyl	2588, 2902, 2903, 3021
oxydemeton-methyl	2783, 2784, 3017, 3018
oxydisulfoton	2783, 2784, 3017, 3018
(*) paraoxon	2783, 2784, 3017, 3018
paraquat	2781, 2782, 3015, 3016
parathion	2783, 2784, 3017, 3018
parathion-methyl	2783, 2784, 3017, 3018
(*) pentachlorophenol	2761, 2762, 2995, 2996
phenkapton	2783, 2784, 3017, 3018
phenthoate	2783, 2784, 3017, 3018
phorate	2783, 2784, 3017, 3018

(*) Not ISO common name.

2601
(cont'd)

Substance	Identification number
phosalone	2783, 2784, 3017, 3018
phosfolan	2783, 2784, 3017, 3018
phosmet	2783, 2784, 3017, 3018
phosphamidon	2783, 2784, 3017, 3018
pindone, and salts of	2902, 2903, 3021
pirimicarb	2757, 2758, 2991, 2992
pirimiphos-ethyl	2783, 2784, 3017, 3018
promecarb	2757, 2758, 2991, 2992
(*) promurit (muritan)	2757, 2758, 2991, 2992
propaphos	2783, 2784, 3017, 3018
propoxur	2757, 2758, 2991, 2992
prothoate	2783, 2784, 3017, 3018
pyrazophos	2784, 3017, 3018
(*) pyrazoxon	2783, 2784, 3017, 3018
quinalphos	2783, 2784, 3017, 3018
(*) rotenone	2588, 2902, 2903, 3021
(*) salithion	2783, 2784, 3017, 3018
schradan	2783, 2784, 3017, 3018
(*) sodium arsenite	2759, 2760, 2993, 2994
(*) strychnine	2588, 2902, 2903, 3021
sulfotep	2783, 2784, 3017, 3018
(*) sulprofos	2783, 2784, 3017, 3018
2,4,5-T	2766, 2999, 3000
temephos	2783, 2784, 3017, 3018
TEPP	2783, 2784, 3017, 3018
terbufos	2783, 2784, 3017, 3018
terbumeton	2764, 2997, 2998
(*) thallium compounds	2588, 2902, 2903, 3021
(*) thallium sulphate	2588, 2902, 2903, 3021
thiometon	2783, 2784, 3017, 3018
(*) thionazin	2783, 2784, 3017, 3018
triadimefon	2766, 2999, 3000
triamiphos	2783, 2784, 3017, 3018
triazophos	2783, 2784, 3017, 3018
(*) tributyltin compounds	2786, 2787, 3019, 3020
tricamba	2770, 3003, 3004
trichlorfon	2783, 2784, 3017, 3018
trichloronat	2783, 2784, 3017, 3018
(*) triphenyltin compounds other than fentin acetate and fentin hydroxide	2786, 2787, 3019, 3020
vamidothion	2783, 2784, 3017, 3018
warfarin, and salts of	3024, 3025, 3026, 3027

(*) Not ISO common name.

2601 90° (a) Add:
(cont'd)

'3315 *chemical sample, toxic, liquid or solid*'.

Add the following note:

'*Note:* The entry "3315 chemical sample, toxic, liquid or solid", only concerns 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 should 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 providing prior approval has been granted by the competent authority or the Director-General of the Organization for the Prohibition of Chemical Weapons.'

Note 3 at the end of 90°, replace 'of 87°' by 'of 71° to 73°.'

91° Add the following note:

'*Note:* Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), which have contained substances of this Class are not subject to the provisions of this Directive if adequate measures have been taken to nullify any hazard. Hazards are nullified if adequate measures have been taken to nullify all hazards of Classes 1 to 9.'

2601a Amend to read as follows:

'(1) Substances classified under (b) or (c) of 11°, 12°, 14° to 28°, 32° to 36°, 41°, 42°, 44°, 51° to 55°, 57° to 68°, 71° and 90°, carried in conformity with the following provisions, are neither subject to the provisions for this Class contained in this Annex nor to those contained in Annex B, except as provided for in paragraph (3) below (rest of existing text unchanged).

(2) Substances referred to in paragraph (1), contained in metal or plastics inner packagings and carried in shrink-wrapped or stretch-wrapped trays used as outer packagings in conformity with the following provisions, are neither subject to the provisions for this Class contained in this Annex nor to those contained in Annex B, except as provided for in paragraph (3) below:

- (a) solid substances classified under (b) of each item: not more than 500 g per inner packaging and not more than 4 kg per package;
- (b) liquid substances classified under (b) of each item: not more than 100 ml per inner packaging and not more than 2 litres per package;
- (c) solid substances classified under (c) of each item: not more than 3 kg per inner packaging;
- (d) liquid substances classified under (d) of each item: not more than 1 litre per inner packaging and not more than 12 litres per package.

The total gross mass of the package shall not exceed 20 kg in any case.

The "General conditions of packing" of marginal 3500(1), (2) and (5) to (7) shall be observed.

(3) For carriage in accordance with paragraphs (1) and (2) above, the description of the goods in the transport document shall conform to the requirements of marginal 2614 and include the words "limited quantity". Each package shall be clearly and durably marked with the identification number of the goods shown in the transport document, preceded by the letters "UN".'

- 2603 (1) (b) 2. Amend the reference 'marginals 2211, 2212 (1)(a), 2213, 2215 and 2218' to read 'marginals 2211 (1) to 2213, 2215 to 2217 and 2223'.
- 2605 (1) (a)/(b)
- (2) (b) Amend the reference to 'marginals 2215 (1) and 2216' to read 'marginals 2215 to 2217'.
- 2606 (1) and (2) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.
- 2607 (1) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.
- Note:* Replace 3560 by 3561.
- 2608 (1) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.
- Note:* Replace 3560 by 3561.
- (2) Delete 'rigid' before '... plastics inner receptacle' and add: 'IBCs of type 31HZ2 shall be filled to at least 80 % of the volume of the outer casing.'
- 2609
(new) Insert the following new marginal:
- '2609 3315 chemical sample, toxic, of 90° (a) shall be packed according to packing instruction 623 in the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air.'
- 2611 (7) Delete.
- Renumber (8) and (9) as (7) and (8).
- (8) (new (7)) Delete '2001 (7)'.
- 2612 (3) Replace '8°' by '8° (a) 2.'
- Replace '11°' by '11°(a) and (b)2.'
- (4) For '71° to 73°' read '72'
- (5) Insert '8° (a) 1.,' between '7° (a) 1.,' and '10°', and insert '11°(b)1.' after '10°'.
- (11) Delete. Renumber (12) as (11).
- 2614 Insert the following paragraphs after the text '[see marginal 2002 (8)]':
- 'For the carriage of substances and preparations used as pesticides, the description of the goods shall include an indication of the active ingredients in conformity with the nomenclature approved by ISO⁽²⁾, or with the table in 2601, 71° to 73°, or the chemical name of the active ingredient(s), e.g. 2783 organophosphorus pesticide, solid, toxic, (propaphos), 6.1, 73° (c), ADR.'
- 'For the carriage of 3315 chemical sample, toxic, 90° (a), a copy of the transport permit, indicating the limit quantities and packing requirements shall be attached to the transport document [see also note to 90° (a)].'
- In footnote (1) delete 'In the case of pesticides, the name to be entered should be that given in ISO Standard 1750 if listed.'
- Add a new footnote: '(2) See ISO 1750:1981, as amended, and addenda.'
- 2625 and section D: delete.
- Renumber marginals as
- 2623-
2649

CLASS 6.2

INFECTIOUS SUBSTANCES

2650 (2) First sentence, read:

‘Class 6.2 comprises substances which are known or reasonably expected to contain pathogens. Pathogens are defined as micro-organisms (including bacteria, viruses, rickettsia, parasites and fungi) or recombinant micro-organisms (hybrid or mutant), that are known or reasonably expected to cause infectious disease in animals or humans.’

Footnote ⁽²⁾: Amend to read:

See ‘*Laboratory Biosafety Manual*, second edition (1993) of the World Health Organization (WHO).’

Delete the last part of the sentence.

(4) Subparagraphs (i) to (iii), read:

- ‘ (i) *Risk group 4*: a pathogen that usually causes serious human or animal disease and that can be readily transmitted from one individual to another, directly or indirectly, and for which effective treatment and preventive measures are not usually available (i.e., high individual and community risk).
- (ii) *Risk group 3*: a pathogen that usually causes serious human or animal disease but does not ordinarily spread from one infected individual to another, and for which effective treatment and preventive measures are available (i.e. high individual risk and low community risk).
- (iii) *Risk group 2*: a pathogen that can cause human or animal disease but is unlikely to be a serious hazard, and, while capable of causing serious infection on exposure, for which there are effective treatment and preventive measures available and the risk of spread of infection is limited (i.e. moderate individual risk and low community risk).’

Delete sub-paragraph (iv).

Amend Note 1 to read:

‘*Note 1*: Risk group 1 includes micro-organisms that are unlikely to cause human or animal disease (i.e. no, or very low, individual or community risk). Substances containing only such micro-organisms are not considered infectious substances for the purposes of these provisions.’

(6) Replace existing text concerning ‘biological products’ with the following:

‘*Biological products* are those products derived from living organisms, that are manufactured and distributed in accordance with the requirements of national governmental authorities which may have special licensing requirements, and are used either for prevention, treatment, or diagnosis of disease in humans or animals, or for development, experimental or investigational purposes related thereto. They include, but are not limited to, finished or unfinished products such as vaccines and diagnostic products.’

2654 (3) (b) Existing text, replace to read:

‘The samples shall be subjected to a water spray that simulates exposure to rainfall of approximately 5 cm per hour for at least one hour. It shall then be subjected to the test described in (a).’

(4), (5), (6)

Renumber existing paragraphs (4) and (5) to (5) and (6) respectively and insert a new paragraph (4) as follows:

‘(4) The competent authority may permit the selective testing of packagings that differ only in minor respects from a tested type, e.g. smaller sizes of inner packagings or inner packagings of lower net mass; and packagings such as drums, bags and boxes which are produced with small reductions in external dimension(s).’

2654 (7) Add a new paragraph (7) as follows:

(cont'd)

'(7) Inner receptacles of any type may be assembled within an intermediate (secondary) packaging and transported without testing in the outer packaging under the following conditions:

- (a) The intermediate/outer packaging combination shall have been successfully tested in accordance with sub-paragraph (3)(a) with fragile (e.g. glass) inner receptacles;
- (b) The total combined gross mass of inner receptacles shall not exceed one half the gross mass of inner receptacles used for the drop test in (a) above;
- (c) The thickness of cushioning between inner receptacles and between inner receptacles and the outside of the intermediate packaging shall not be reduced below the corresponding thicknesses in the originally tested packaging; and if a single inner receptacle was used in the original test, the thickness of cushioning between inner receptacles shall not be less than the thickness of cushioning between the outside of the intermediate packaging and the inner receptacle in the original test. When either fewer or smaller inner receptacles are used (as compared to the inner receptacles used in the drop test), sufficient additional cushioning material shall be used to take up the void;
- (d) The outer packaging shall have successfully passed the stacking test in marginal 3555 while empty. The total mass of identical packages shall be based on the combined mass of inner receptacles used in the drop test in (a) above;
- (e) For inner receptacles containing liquids, an adequate quantity of absorbent material to absorb the entire liquid content of the inner receptacles shall be present;
- (f) If the outer packaging is intended to contain inner receptacles for liquids and is not leakproof, or is intended to contain inner receptacles for solids and is not siftproof, a means of containing any liquid or solid contents in the event of leakage shall be provided in the form of a leakproof liner, plastics bag or other equally effective means of containment;
- (g) The markings on packagings in conformity with this paragraph shall include the letter "U" immediately following the marking prescribed in marginal 3512 (1) (c) (iii).'

2655 (1) (c) Insert 'or aluminium' after 'steel'.

2661 (4) Delete '2001 (7)'.

2662 (4) Delete.

Renumber (5) as (4).

2675 and section E:

Delete.

Renumber marginals as

2675-
2699

CLASS 8

CORROSIVE SUBSTANCES

2800 (3) (c) Replace 'animal experiments' by 'experiments'.

(f) Last sentence, replace 'type P3 (ISO 2604 (IV); 1975) by 'type P235 (ISO 9328 II); 1991)'.

At the end, add the sentence:

'An acceptable test is described in standard ASTM G31-72 (extended in 1990)'.

2801

1° (a) Amend entry 1829 to read:

'1829 *sulphur trioxide, inhibited* (sulphuric anhydride, inhibited) or

1829 *sulphur trioxide, stabilized* (sulphuric anhydride, stabilized)'

Insert the following note:

'Note: 1829 sulphur trioxide shall be inhibited. Sulphur trioxide, 99,95 % pure or above, may also be transported without inhibitor in tanks provided that its temperature is maintained at or above 32,5 °C.'

5° Amend the note to read:

'1048 hydrogen bromide, anhydrous, and 1050 hydrogen chloride, anhydrous, are substances of Class 2 (see marginal 2201, 2°TC).'

9° In the note, replace '63°(c), 64°(c) or 87°(c)' by '71° to 73°'.

12° (a) Delete entry 1809.

41° (c) Delete '*pentahydrate*' under entry 3253 (twice).

42° (b) and (c)

Add a new entry 3320 as follows:

'3320 *sodium borohydride and sodium hydroxide solution*, with not more than 12 % sodium borohydride and not more than 40 % sodium hydroxide by mass.'

43° (c) Amend note 1 to read:

'1005 ammonia, anhydrous, 3318 ammonia solution, with more than 50 % ammonia, and 2073 ammonia solution, with more than 35 % but not more than 50 % ammonia, are substances of Class 2 (see marginal 2201, 2°TC, 4°TC and 4°A).'

53° (c) Delete entry 2542.

54° (b) Insert the following entry:

'2686 *2-diethylaminoethanol*'.

61° (b) and (c)

Amend entry 1908 to read: '1908 *chlorite solution*'.

Amend entry 1791 to read: '1791 *hypochlorite solution*' (delete the references to the percentage of available chlorine).

Delete note 1.

Renumber existing 'note 2' as 'note'.

66° (a) Add the following entry:

'2801 *dye, liquid, corrosive, n.o.s.* or

2801 *dye intermediate, liquid, corrosive, n.o.s.*'

91° Add the following note:

'Note: Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), which have contained substances of this Class are not subject to the provisions of this Directive if adequate measures have been taken to nullify any hazard. Hazards are nullified if adequate measures have been taken to nullify all hazards of Classes 1 to 9.'

2801a Amend the beginning as follows:

‘Neither the provisions of this Class contained in this Annex nor those contained in Annex B, except as provided for in paragraph (6) below, are applicable to:’

Insert a new paragraph (2) as follows:

‘(2) Substances of 1° to 5°, 7° to 13°, 16°, 17°, 31° to 47°, 51° to 56° and 61° to 76° contained in metallic or plastics inner packagings carried in shrink-wrapped or stretch-wrapped trays as outer packagings in conformity with the following provisions:

- (a) liquid substances classified under (b) of each item: not more than 500 ml per inner packaging and not more than 4 litres per package;
- (b) solid substances classified under (b) of each item: not more than 1 kg per inner packaging and not more than 12 kg per package;
- (c) liquid substances classified under (c) of each item: not more than 1 litre per inner packaging and not more than 12 litres per package;
- (d) solid substances classified under (c) of each item: not more than 2 kg per inner packaging.

The total gross mass of the package shall not exceed 20 kg in any case. The “General conditions of packing” of marginal 3500(1), (2) and (5) to (7) shall be observed.’

Renumber existing (2) as (3).

Renumber existing paragraph (3) as (5).

Insert the following new paragraph (4):

‘(4) (a) New storage batteries, when:

- they are secured in such a way that they cannot slip, fall or be damaged;
- they are provided with carrying devices, unless they are suitably stacked, e.g. on pallets;
- there are no dangerous traces of alkalis or acids on the outside;
- they are protected against short circuits.

(b) Used storage batteries, when:

- their cases are undamaged;
- they are secured in such a way that they cannot leak, slip, fall or be damaged, e.g. by stacking on pallets;
- there are no dangerous traces of alkalis or acids on the outside of the articles;
- they are protected against short circuits.

“Used storage batteries” means storage batteries transported for recycling at the end of their normal service life.’

(6) Add a new paragraph (6) as follows:

‘(6) For carriage in accordance with paragraph (1) or (2) above the description of the goods in the transport document shall conform to the requirements of marginal 2814 and include the words “limited quantity”. Each package shall be clearly and durably marked with the identification number of the goods shown in the transport document, preceded by the letters “UN”.’

2803 In the second paragraph amend the reference ‘marginals 2211, 2213 (1) and (2), 2215, 2216 and 2218)’ to read ‘marginals 2212, 2213, 2215 to 2217 and 2223’.

2804 (2) (d) Amend the reference to ‘marginal 2211’ to read ‘marginal 2212’.

Amend the reference to ‘marginals 2215(1) and 2216(1)’ to read ‘marginals 2215 to 2217’.

2805 (1) and (2) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.

2806 (1) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.

Note: Replace 3560 by 3561.

2807 (1) Insert 'or aluminium' after 'steel' for 'steel jerricans conforming to marginal 3522'.

Note: Replace 3560 by 3561.

(2) Delete 'rigid' before 'plastics inner receptacle' and add 'IBCs of type 31HZ2 shall be filled to at least 80 % of the volume of the outer casing.'

Add the following new paragraph (6):

'(6) Used storage batteries of 81° (c) may also be carried in stainless steel or solid plastics battery boxes, of a capacity of up to 1 m³, under the following conditions:

- (a) The battery boxes shall be resistant to the corrosive substances contained in the storage batteries;
- (b) Under normal conditions of carriage, no corrosive substance shall leak from the battery boxes and no other substance (e.g. water) shall enter the battery boxes. No dangerous residues of corrosive substances contained in the storage batteries shall adhere to the outside of the battery boxes;
- (c) The battery boxes shall not be loaded with storage batteries to a height greater than the height of their sides;
- (d) No storage battery containing substances or other dangerous goods which may react dangerously with one another [see marginal 2811(6)] shall be placed in a battery box;
- (e) The battery boxes shall be either:
 - (i) covered; or
 - (ii) carried in closed or sheeted open vehicles.'

Add the following new paragraph (7):

'(7) Used storage batteries of 81° (c) may also be carried in steel IBCs conforming to marginal 3622, in rigid plastics IBCs conforming to marginal 3624, or in composite IBCs with a rigid plastics inner receptacle and an outer casing of steel or plastics material conforming to marginal 3625.

IBCs shall be subjected to testing in accordance with marginals 3652, 3653, 3655 and 3658. The provisions for substances of packing group III shall apply.

The design type shall be approved by the competent authority. IBCs shall have leakproof closures and shall meet the other requirements of paragraph (6).'

2811 (7) Delete. Renumber (8) and (9) as (7) and (8).

(8) (new (7)) Delete '2001 (7)'.
(9) Delete.

2812 (10) Delete entry 1809 from the table.

(11) Delete.

Renumber (12) as (11).

2814 Add:

'For the transport of 1829 sulphur trioxide, inhibited, 99,95 % pure and above, of 1° (a), without inhibitor in tanks at a minimum temperature of 32,5 °C, the specification "Transport under minimum temperature of the product of 32,5 °C" shall appear in the transport document.'

2825 and section D: Delete.

Renumber marginals as

2823-
2899

CLASS 9

MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES

2900 The two existing paragraphs are numbered (1) and (2).

At the beginning of paragraph (2), insert

‘Substances and articles of Class 9 are sub-divided as follows:

- A. Substances which, on inhalation as fine dust, may endanger health
- B. Substances and apparatus which in the event of fire may form dioxins
- C. Substances evolving flammable vapour
- D. Lithium batteries
- E. Life-saving appliances
- F. Environmentally hazardous substances
- G. Elevated temperature substances
- H. Other substances presenting a hazard during carriage but not meeting the definitions of another class
- I. Empty packagings’

Add a new paragraph (3) as follows:

‘(3) 1845 carbon dioxide, solid (dry ice), 2071 ammonium nitrate fertilizers, 2216 fish meal (fish scrap), stabilized, 2807 magnetized material, 3166 engines, internal combustion, including when fitted in machinery or vehicles and 3171 battery-powered vehicle or battery-powered equipment (wet battery), listed in the Recommendations on the Transport of Dangerous Goods, are not subject to the provisions of this Directive.’

2901 3° Add the following note:

‘Note: Special conditions of packing are applicable to these substances (see marginal 2905).’

4° Delete the word ‘Expandable’ in the heading of 4°.

(c) Add the following entry in item 4° (c):

‘3314 *plastics moulding compound* in dough, sheet or extruded rope form evolving flammable vapour’

Add the following note:

‘Note: Polymeric beads and polymers for moulding may be made from polystyrene, poly(methyl methacrylate) or other polymeric material.’

Amend section D. as follows:

‘D. Lithium batteries

Note: Special packing conditions are applicable to these articles (see marginal 2906).

2901
(cont'd)

5° 3090 lithium batteries, 3091 lithium batteries contained in equipment or 3091 lithium batteries packed with equipment.

- Note:* 1. Each cell shall not contain more than 12 g of lithium or lithium alloy. The quantity of lithium or lithium alloy contained in each battery shall not be more than 500 g. With the approval of the competent authority of the country of origin, the quantity of lithium or lithium alloy in each cell may be raised to 60 g and a package may contain up to 2,500 g of lithium or lithium alloy; the competent authority shall determine the conditions of carriage as well as the type and duration of the test.
2. Cells and batteries shall be equipped with an effective means of preventing external short circuits. Each cell and battery shall incorporate a safety venting device or be designed in such a manner that will preclude a violent rupture under normal conditions of carriage. Batteries containing cells or series of cells connected in parallel shall be equipped with diodes to prevent reverse current flow. Cells or batteries contained in equipment shall be protected against short circuits and be securely held in place.
3. Cells and batteries shall be so designed and constructed that they are capable of meeting the following tests:
- (a) ten cells and one battery of each type taken from production each week shall be subjected to the tests of extreme temperature exposure and the short circuit test procedures in section 38.3 of the Manual of Tests and Criteria or, subject to competent authority approval, equivalent tests. There shall be no evidence of distortion, leakage or internal heating in conducting the extreme temperature exposure test. In the conducting the short circuit test procedure, if venting occurs, an open flame applied to venting fumes shall not produce an explosive condition; and
- (b) cells and batteries shall be exempted from sub-paragraph (a) above if they are hermetically closed provided that, prior to the first consignment, 10 cells or four batteries of each type to be offered for transport are subjected in sequence to the altitude simulation, extreme temperature exposure, vibration, and shock test procedures as described in section 38.3 of the Manual of Tests and Criteria, or equivalent tests approved by the competent authority, with no visible evidence of out-gassing, leakage, loss of mass or distortion.
4. Cells contained in equipment shall not be capable of being discharged during carriage to the extent that the open circuit voltage falls below 2 volts or two thirds of the voltage of the undischarged cell, whichever is the lower.
5. Articles of 5° which do not meet these conditions are not to be accepted for carriage.'

Amend the note to heading E (Life-saving appliances) to read as follows:

'*Note:* Special packing conditions are applicable to articles of 6° and 7° (see marginal 2907).'

8° (c) Delete: '3268 seat-belt modules'.

In note 1 replace the words "seat-belt pre-tensioners", "air bag modules" or "seat-belt modules" with "seat-belt pre-tensioners" or "air bag modules" and replace the words 'Recommendations on the Transport of Dangerous Goods,' with 'Manual of'.

For 'Part I of the Manual of Tests and Criteria' read 'the Manual of Tests and Criteria, Part I, Chapter 16'.

Delete footnote (1).

In the note under the title F, for 'section G, marginals 3390 to 3396', read 'section C, marginals 3320 to 3326'.

2901 11° Amend the end of the heading of item 11° to read as follows:

(cont'd) '...or in items 1° to 8°, 13°, 14°, 20°, 33° and 34° of this Class.'

12° Amend the end of the heading of item 12° to read as follows:

'...or in items 1° to 8°, 13°, 14°, 21°, 31°, 32° and 35° of this Class.'

Existing section G. becomes section I. and item '21°' is renumbered '71°'.

Insert a new section G. as follows:

'G. Elevated temperature substances:

Note: Special packing conditions are applicable to these substances (see marginal 2909).

20° Substances which are carried or handed over for carriage in the liquid state at or above 100 °C and, in the case of those with a flash-point, below their flash-point.

(c) 3257 *elevated temperature liquid, n.o.s.* (including molten metal or molten salt) at or above 100 °C and, for a substance with a flash-point, below its flash-point.

Note: 1. This item shall only be used when the substance does not meet the criteria of any other Class.

2. 3256 *elevated temperature liquid, flammable, n.o.s.* with a flash-point above 61 °C, at or above its flash-point is a substance of Class 3 [see marginal 2301, 61° (c)].

21° Solids which are carried or handed over for carriage at or above 240 °C.

(c) 3258 *elevated temperature solid, n.o.s.* at or above 240 °C.

Note: This item shall only be used when the substance does not meet the criteria of any other Class.'

Add a new section H. as follows:

'H. Other substances presenting a hazard during carriage but not meeting the definitions of another Class:

31° Solid ammonia compound having a flash-point below 61 °C:

(c) 1841 *acetaldehyde ammonia*

32° Low hazard dithionite:

(c) 1931 *zinc dithionite*

Note: Dithionites in spontaneously combustible form are substances of Class 4.2 [see marginal 2431, item 13° (b)].

33° Highly volatile liquid:

(c) 1941 *dibromodifluoromethane*

34° Substance emitting noxious fumes:

(c) 1990 *benzaldehyde*

35° Substances containing allergens:

Note: Substances which have undergone sufficient heat treatment so that they present no danger during carriage are not subject to the provisions of this Directive.

(b) 2969 *castor beans* or 2969 *castor meal* or 2969 *castor pomace* or 2969 *castor flake*'

2901 Add the following new item:

(cont'd)

'36° Chemical kits and first aid kits

(b) 3316 chemical kit or 3316 first aid kit

(c) 3316 chemical kit or 3316 first aid kit

Note: The entry 3316 chemical kit or 3316 first aid kit includes boxes, cases, etc. containing small quantities of various dangerous goods which are used for medical, analytical or testing purposes. Such kits shall not contain dangerous goods of Class 1, Class 2 (with the exception of aerosols) assigned to groups O, F, T, TF, TC, TO, TFC or TOC, Class 4.1, 21° to 50°, Class 4.2, Class 5.1, 5°, Class 5.2, 11° to 20°, Class 6.1, 1° to 5°, Class 6.2, Class 7, Class 8, 6° and 14° or any other substance classified under (a) of whatever item number or Class.

Components shall not react dangerously (see marginal 2911(4)). 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. The total quantity of dangerous goods in any one kit shall not exceed either 1 l or 1 kg. The maximum total quantity of dangerous goods in any one outer packaging shall not exceed 10 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 shall be packed in packagings which meet the requirements appropriate to the packing group assigned to the kit as a whole. Kits which are carried on board vehicles for first-aid or operating purposes are not subject to the provisions of this Directive.'

71° (old 21°)

21° Item 21° is renumbered 71° and amended to read:

'71° *Empty packagings*, including *empty intermediate bulk containers (IBCs)*, *empty tank-vehicles*, *empty demountable tanks* and *empty tank-containers*, uncleaned, having contained substances of 1°, 2°, 4°, 11°, 12°, 20°, 21°, or 31° to 35°.

Note: Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), which have contained substances of this Class are not subject to the provisions of this Directive if adequate measures have been taken to nullify any hazard. Hazards are nullified if adequate measures have been taken to nullify all hazards of Classes 1 to 9.'

2901a (1) Amend the beginning to read as follows:

'Substances classified under (b) or (c) of items 1°, 2°, 4°, 11°, 12°, 31°, 32°, 33° and 34° carried in conformity with the following provisions, are subject neither to the provisions for this Class, contained in this Annex nor to those contained in Annex B, except as provided for in paragraph (2) below:'

After the sentence 'These quantities of substances ...' insert:

'These quantities of substances contained in metal or plastics inner packagings may also be carried in shrink-wrapped or stretch-wrapped trays used as outer packagings provided that the maximum mass per package is not exceeded and the total gross mass of the package does not exceed 20 kg in any case.'

(2) Add a new paragraph (2) as follows:

'(2) For carriage in accordance with paragraph (1) above the description of the goods in the transport document shall conform to the requirements of marginal 2914 and include the words "limited quantity". Each package shall be clearly and durably marked with the identification number of the goods shown in the transport document, preceded by the letters "UN".'

2901a Renumber existing paragraphs (2), (3) and (4) as (3), (4) and (5).
(*cont'd*)

(4) [existing (3)] Add at the end:

'... and the description of the goods in the transport document shall conform to the requirements of marginal 2914 and include the words "limited quantity". Each package shall be clearly and durably marked with the identification number of the goods shown in the transport document, preceded by the letters "UN".'

(5) [existing (4)] Amend to read as follows:

'Lithium cells and batteries of 5° packed alone or with equipment conforming to the following conditions and equipment containing only such cells or batteries are not subject to the provisions for this Class contained in this Annex and in Annex B:

- (a) each cell with a liquid cathode contains not more than 0,5 g of lithium or lithium alloy, and each cell with a solid cathode contains not more than 1 g of lithium or lithium alloy;
- (b) each battery with a solid cathode contains not more than an aggregate quantity of 2 g of lithium or lithium alloy and each battery with a liquid cathode contains not more than an aggregate quantity of 1 g of lithium or lithium alloy;
- (c) each cell or battery containing a liquid cathode is hermetically sealed;
- (d) cells are separated so as to prevent short circuits;
- (e) batteries are separated so as to prevent short circuits and are packed in strong packagings, except when installed in electronic devices;
- (f) if a liquid cathode battery contains more than 0,5 g of lithium or lithium alloy, or a solid cathode battery contains more than 1 g of lithium or lithium alloy, it does not contain a liquid or gas which is considered dangerous unless the liquid or gas, if free, would be completely absorbed or neutralized by other materials in the battery.

Lithium cells and batteries conforming to the following provisions may also be considered as not subject to the conditions for this Class contained in this Annex or in Annex B:

- (g) each cell contains not more than 5 g of lithium or lithium alloy;
- (h) each battery contains not more than 25 g of lithium or lithium alloy;
- (i) each cell or battery is of a type proved to be not subject to this Directive, in view of the results obtained in the tests described in the Manual of Tests and Criteria, Part III, section 38.3. These tests shall be carried out on each type prior to its presentation for carriage for the first time; and
- (j) the cells and batteries are designed or packed in such a way as to prevent short circuits under normal conditions of carriage.'

2903 (1) (c) Insert 'or aluminium' after 'steel'.

Note: Replace 3560 by 3561.

2904 (1) Insert 'or aluminium' after 'steel'.

Note: Replace 3560 by 3561.

(4) Add the following sentence:

'Articles of 8° (c) may also be directly packed into outer packagings listed in marginal 3538(b) and tested at the packing group III level.'

Note: 3268 Airbag inflators and 3268 airbag modules and 3268 seat-belt pretensioners may be transported unpackaged in dedicated handling devices, vehicles or large containers when transported from where they are manufactured to an assembly plant.'

2906 Amend to read:

‘(1) Articles of 5° shall be packed in:

- (a) boxes conforming to marginal 3527 for natural wood, 3528 for plywood or 3530 for fibreboard, or
- (b) drums conforming to marginal 3523 for plywood, 3525 for fibre or 3526 for plastics, removable head; or
- (c) combination packagings with inner packagings of fibreboard and outer packagings of steel or aluminium conforming to marginal 3538. The inner packagings shall be separated from each other and from the inner surfaces of the outer packagings using non-combustible cushioning material of at least 25 mm thickness; this requirement is not, however, applicable to cells or batteries of a type conforming to the Provisions of marginal 2901, 5°, note 3 (b).

These packagings shall conform to a design type which has been tested and approved, in accordance with Appendix A.5, for packing group II. This requirement is not, however, applicable to cells or batteries of a type conforming to the provisions of marginal 2901, 5°, note 3 (b). No single packaging or inner packaging of a combination packaging shall contain more than 500 g of lithium or lithium alloy (see, however, marginal 2901, 5°, note 1).

(2) Lithium batteries of 5° shall be packed and be securely stowed so as to prevent movement which could lead to short circuits.

(3) Used lithium cells and batteries shall be accepted for carriage under the conditions prescribed in paragraphs (1) and (2) above. Non-approved packagings shall, however, be permitted provided that:

- they meet the “General packing conditions” of marginal 3500 (1), (2), (5) and (6);
- the cells and batteries are packed and stowed so as to prevent any risk of short circuits;
- the packages weigh not more than 30 kg.

(4) If the lithium cells or batteries are packed with equipment, they shall be placed in fibreboard inner packagings conforming to the conditions of packing group II. If the lithium cells or batteries are carried in equipment, such equipment shall be packed in strong outer packagings so as to prevent accidental operation during carriage.’

2909 Insert a new marginal as follows:

‘2909 (1) Substances of 20° (c) may only be carried in tank-vehicles (see Appendix B.1a) or in tank-containers (see Appendix B.1b) or in special vehicles [see marginal 91 111(2)].

(2) Substances of 21° (c) shall be transported in accordance with conditions specified by the competent authority of the country of origin.’

2911 In paragraphs (2) and (3) amend the words ‘except substances of 13°’ to read ‘except substances of 13°, 20° and 21°’.

(6) Delete ‘2001 (7)’.

2912 Delete existing paragraph (7).

Renumber existing paragraphs (3) to (6) to (4) to (7).

Insert the following new paragraph (3):

‘(3) Packages containing used cells or batteries of 5°, in unmarked packagings, shall bear the inscription: “Used lithium cells”.’

2921 Replace ‘21°’ by ‘71°’ throughout.

PART III

APPENDICES TO ANNEX A

APPENDIX A.1

Amend the title of section A to read:

'A. Stability and safety conditions relating to explosive substances and articles and nitrated mixtures of nitrocellulose'

3101 (1) Amend to read:

'Any substance or article having or suspected of having explosive properties shall be considered for assignment to Class 1 in accordance with the tests, procedures and criteria prescribed in Part I of the Manual of Tests and Criteria.

A substance or article assigned to Class 1 can only be accepted for carriage when it has been assigned to a name or n.o.s. entry listed in marginal 2101 and meets the criteria of the Manual of Tests and Criteria.'

(2) For 'Test Manual' read 'Manual of Tests and Criteria'.

3102 (1) For '24 (a)' read '24 (b)'.

3103 to 3106: Delete.

Renumber marginals as

3103-
3169

3170 *Note 1:* For 'Test Manual' read 'Manual of Tests and Criteria' (twice).

In note 1, for 'the Manual of Tests and Criteria mentioned in marginal 3101 (1)' read 'the Manual of Tests and Criteria, Part I'.

For '*Cartridges, for weapons, blank*, 27°/0338; 47°/0014' read '*Cartridges, small arms* 27°/0327; 27°/0338; 47°/0014'.

For the entry '*Detonator assemblies, non-electric*, for blasting', add: '47°/0500'.

Amend the entry '*Fuse, instantaneous, non-detonating (quickmatch)* 30°/0101' as follows:

'Fuse, non-detonating 30°/0101'

Article consisting of cotton yarns impregnated with fine black powder. It burns with an external flame and is used in ignition trains for fireworks, etc. It can be enclosed in a paper tube to obtain an instantaneous or quickmatch effect.

In the note to the definition of 'igniters' delete the word 'instantaneous'.

Add the following entry:

'Samples, explosive, other than initiating explosive 51°/0190

New or existing explosive substances or articles, not yet assigned to a name of marginal 2101 and carried in conformity with the instructions of the competent authority and generally in small quantities, *inter alia*, for the purposes of testing, classification, research and development, or quality control, or as commercial samples.

Note: Explosive substances or articles already assigned to another name of marginal 2101 are not included in this definition.'

APPENDIX A.2

- 3200 (1) Amend the first sentence to read:

‘The materials of aluminium-alloy receptacles which are to be accepted for the gases referred to in marginal 2203 (1)(d) shall satisfy the following requirements:’

- 3252 (2) Amend the reference ‘marginal 2207’ to read ‘marginal 2206’.

Amend the heading for part C. of Appendix A.2 to read:

‘C. Provisions relating to tests on aerosol dispensers and receptacles, small, containing gas (gas cartridges) of Class 2, 5°’

- 3291 Add at the end:

‘The requirements of this marginal are deemed to be met if the following standard is complied with:

EN 417: 1992 for 2037 receptacles, small, containing gas (gas cartridges) of 5° containing 1965 hydrocarbon gas mixtures, liquefied, n.o.s.’

- 3292 (1) Amend the text ‘For the test on aerosol dispensers (10°) and non-refillable containers for gas under pressure (11°) ...’ to read:

‘For the test on aerosol dispensers and receptacles, small, containing gas (gas cartridges) of 5° ...’

- (3) Add a new paragraph (3) as follows:

‘(3) The requirements of this marginal are deemed to be met if the following standard is complied with:

EN 417: 1992, for 2037 receptacles, small, containing gas (gas cartridges) of 5° containing 1965 hydrocarbon gas mixtures, liquefied n.o.s.’

APPENDIX A.3

A. Tests relating to flammable liquids of Classes 3, 6.1 and 8

3300- Replace the existing text with the following new text:

3301

'Test for determining flashpoint

3300 (1) The flashpoint shall be determined by means of one of the following types of apparatus:

- (a) Abel;
- (b) Abel-Pensky;
- (c) Tag;
- (d) Pensky-Martens;
- (e) Apparatus in accordance with ISO 3679 or ISO 3680: 1983

(2) To determine the flashpoint of paints, gums and similar viscous products containing solvents, only apparatus and test methods suitable for determining the flashpoint for viscous liquids shall be used, in accordance with the following standards:

- (a) International Standard ISO 3679: 1983;
- (b) International Standard ISO 3680: 1983;
- (c) International Standard ISO 1523: 1983;
- (d) German Standard DIN 5321: 1978, Part 1

3301 (1) The test procedure shall be either according to an equilibrium method or according to a non-equilibrium method.

(2) For the procedure according to an equilibrium method, see:

- (a) International Standard ISO 1516: 1981;
- (b) International Standard ISO 3680: 1983;
- (c) International Standard ISO 1523: 1983;
- (d) International Standard ISO 3679: 1983

(3) The procedure according to a non-equilibrium method shall be:

(a) for the Abel apparatus, see:

- (i) British Standard BS 2000 Part 170: 1995;
- (ii) French Standard NF MO7-011: 1988;
- (iii) French Standard NF T66-009: 1969

(b) for the Abel-Pensky apparatus, see:

- (i) German Standard DIN 51755, Part 1: 1974 (for temperatures from 5 °C to 65 °C);
- (ii) German Standard DIN 51755, Part 2: 1978 (for temperatures below 5 °C);
- (iii) French Standard NF MO7-036: 1984

(c) for the Tag apparatus, see American Standard ASTM D 56: 1993

(d) for the Pensky-Martens apparatus, see:

- (i) International Standard ISO 2719: 1988;
- (ii) European Standard EN 22719 in each of its national versions (e.g. BS 2000, part 404/EN 22719): 1994;
- (iii) American Standard ASTM D 93: 1994;
- (iv) Institute of Petroleum Standard IP 34: 1988

3301 (cont'd) (4) The test methods listed in paragraphs (2) and (3) shall only be used for flashpoint ranges which are specified in the individual methods. The possibility of chemical reactions between the substance and the sample holder shall be considered when selecting the method to be used. The apparatus shall, as far as is consistent with safety, be placed in a draught-free position. For safety, a method utilizing a small sample size, around 2 ml, shall be used for organic peroxides and self-reactive substances (also known as "energetic" substances), or for toxic substances.

(5) When the flashpoint, determined by a non-equilibrium method in accordance with paragraph (3) is found to be $23 \pm 2^\circ\text{C}$ or $61 \pm 2^\circ\text{C}$, it shall be confirmed for each temperature range by an equilibrium method in accordance with paragraph (2).'

3302 Amend the last sentence of marginal to read as follows:

'If the difference is more than 2°C , a second check-test shall be carried out, and the lowest figure of the flash-points obtained in either check-test shall be adopted.'

3310 (a) For '(see Figure 1)' read '(see Figure 3)'.

3320 to 3389: Delete these marginals and the headings to sections C to F.

Section G. is relettered C.

Renumber marginals 3390 to 3396 as

3320-
3326

APPENDIX A.5

GENERAL PACKING CONDITIONS, TYPES OF PACKAGING, REQUIREMENTS APPLICABLE TO PACKAGINGS, TEST REQUIREMENTS FOR PACKAGINGS

3500 (14) Renumber existing text to (15).

Insert the following new paragraph (14):

‘Appropriate measures shall be taken to prevent excessive movement of the damaged or leaking packages within a salvage packaging and when the salvage packaging contains liquids, sufficient absorbent material shall be added to eliminate the presence of free liquid.’

3510 Delete ‘(2)’ before ‘Reconditioned packagings’.

Renumber (3) and (4) to (2) and (3).

(1) Insert the following text after ‘reused packagings’:

‘Salvage packagings: special packagings conforming to the applicable provisions of this Appendix into which damaged, defective or leaking dangerous goods packages, or dangerous goods that have spilled or leaked are placed for purposes of carriage for recovery or disposal.’

(3) Insert the following text after ‘inner receptacles’:

‘Intermediate packagings: packagings placed between inner packagings or articles, and an outer packaging.’

3511 (1) Amend the sentence ‘In the case of combination...’ to read as follows:

‘In the case of combination packagings and packagings intended to contain substances of Class 6.2 items 1^o and 2^o, only the code number for the outer packaging shall be used.’

3512 The note at the beginning becomes note 1.

Insert the following two notes:

‘Note: 2. The marking is intended to be of assistance to packaging manufacturers, reconditioners, packaging users, carriers and regulatory authorities. In relation to the use of a new packaging, the original marking is a means for its manufacturers to identify the type and to indicate those performance test recommendations that have been met.

3. The marking does not always provide full details of the test levels, etc., and these may need to be taken further into account, e.g., by reference to a test certificate, to test reports or to a register of successfully tested packagings. For example, a packaging having an X or Y marking may be used for substances to which a packing group having a lesser degree of danger has been assigned with the relevant maximum permissible value of the relative density determined by taking into account the factor of 1,5 or 2,25 indicated in the packaging test requirements in Section IV of this Appendix as appropriate, i.e., Group I packaging tested for substances of relative density 1,2 could be used as a Group II packaging for substances of relative density 1,8 or a Group III packaging of relative density 2,7, provided of course that all the performance criteria can still be met with the higher relative density substance.’

(1) (a) (ii)

Add the following text after ‘... for packagings conforming to marginal 3510 (2)’:

‘and removable head drums and jerricans intended to contain liquids having a viscosity at 23 °C exceeding 200 mm²/s conforming to simplified conditions [see the notes to marginals 2306 (1), 2307 (1), 2507 (1), 2508 (1), 2607 (1), 2608 (1), 2806 (1), 2807 (1), 2903 (1) and 2904 (1)]’.

3512

(cont'd)

(c) (ii)

Amend to read:

'(ii) For packagings without inner packagings, intended to contain liquids, which have successfully passed the hydraulic pressure test, the relative density, rounded off to the first decimal of more than 1,2, for which the design type has been tested; this information may be omitted if the relative density is not more than 1,2; or

For packagings intended to contain solids or inner packagings, and removable head packagings intended to contain substances having a viscosity at 23 °C of more than 200 mm²/s and for removable head light gauge metal packagings intended to contain substances of Class 3, 5^o(c), the maximum gross mass in kg.'

(2) Delete the word 'drums' after 'ISO 3574: 1986 Steel'.

Amend the end of paragraph (1)(d) to read '..., the test pressure rounded down to the nearest 10 kPa'

(5) Replace existing text of paragraph (5) with the following:

'The letter "T", "V" or "W" may follow the packaging code. The letter "T" signifies a salvage packaging conforming to marginal 3559. The letter "V" signifies a special packaging conforming to the provisions of marginal 3558(5). The letter "W" signifies that the packaging, although of the same type indicated by the code, is manufactured to a specification different to that in section III and is considered equivalent under the provisions of marginal 3500(15).'

(7) Insert the following example:

'For removable head packagings intended to contain liquids having a viscosity at 23 °C exceeding 200 mm²/s conforming to simplified conditions [see the notes to marginals 2306(1), 2307(1), 2507(1), 2508(1), 2607(1), 2608(1), 2806(1), 2807(1), 2903(1) and 2904(1)]:

RID/ADR 3H2/Z25/S/97.05	(a) (ii), (b), (c), (d) and (e),
CH-3458 PLASPAC AG	(f) and (g).'

Add the following at the end of paragraph (7):

'For a salvage packaging:

Ⓐ 1A2T/Y300/S/94	(a), (b), (c), (d) and (e),
USA/abc	(f) and (g)

Note: The markings, for which examples are given, may be applied in a single line or in multiple lines provided the correct sequence is respected.'

3513

Amend to read as follows:

'By affixing marking in accordance with marginal 3512 (1), it is certified that mass-produced packagings correspond to the approved design type and that the requirements referred to in the approval have been met.'

3514

Replace the introductory text with the following:

'The following table indicates the codes to be used for designating types of packagings depending on the kind of packagings, the material used for their construction and their category; it also refers to the marginals to be consulted for the appropriate requirements.'

3514 Add aluminium jerricans to the table in marginal 3514 (after steel jerricans) as follows:
(cont'd)

3. Jerricans	A. Steel	non-removable head	3A1	3522
		removable head	3A2	3522 ⁽¹⁾
	B. Aluminium	non-removable head	3B1	3522
		removable head	3B2	3522 ⁽¹⁾
	H. Plastics	non-removable head	3H1	3526 ⁽¹⁾
		removable head	3H2	3526 ⁽¹⁾

3522 Amend to read:

'3522 Steel or aluminium jerricans

3A1 steel, non-removable head 3B1 aluminium, non-removable head

3A2 steel, removable head 3B2 aluminium, removable head

- (a) Body and head should be constructed as steel sheet, of aluminium at least 99 % pure of an aluminium base alloy. Material should be of a suitable type and of adequate thickness in relation to the capacity of the jerrican and to its intended use.
- (b) Chimes of all steel jerricans should be mechanically seamed or welded. Body seams of steel jerricans intended to contain more than 40 litres of liquid should be welded. Body seams of steel jerricans intended to contain 40 litres or less should be mechanically seamed or welded. For aluminium jerricans, all seams should be welded. Chime seams, if any, should be reinforced by the application of a separate reinforcing ring.
- (c) Openings in jerricans (3A1 and 3B1) should not exceed 7 cm in diameter. Jerricans with larger openings are considered to be of the removable head type (3A2 and 3B2).
- (d) Closures should be so designed that they will remain secure and leakproof under normal conditions of transport. Gaskets or other sealing elements should be used with closures, unless the closure is inherently leakproof.
- (e) Maximum capacity of jerrican: 60 litres
- (f) Maximum net mass: 120 kg.'

3538 (b) Insert:

'aluminium removable head jerricans (marginal 3522)'

3551 (6) Insert:

'The compatibility test for tert-Butyl hydroperoxide with more than 40 % peroxide content of 3° (b), 5° (b) and 9° (b) and peracetic acid of 5° (b), 7° (b) and 9° (b) of Class 5.2, marginal 2551, shall not be carried out using standard liquids. For these substances, proof of sufficient chemical compatibility of the test samples shall be provided during a storage period of six months at ambient temperature with the substances they are intended to carry.'

3552 (1) (a) In the first column of the table, under (a), add:

'aluminium jerricans' (after 'steel jerricans').

(2) (d) After '(see 3537)' add 'and',

(e) Amend to read as follows:

'(e) combination packagings with plastics inner packagings other than plastics bags and sachets intended to contain solids or articles (see marginal 3538).'

Delete (f) to (h).

3553 (4) and (5): Place the last sentence of paragraph (4) after the table 'Air pressure to be applied' of paragraph (5).

3558 (5) (f) Amend the end of the last sentence to read: 'containing the liquid contents.'

3559-3560 Marginals 3559 and 3660 are renumbered 3560 and 3561 respectively. As a consequence, the reference to marginal 3560 in the notes to marginals 2306 (1), 2307 (1), 2507 (1), 2508 (1), 2607 (1), 2608 (1), 2806 (1), 2807 (1), 2903 (1) and 2904 (1) is to be replaced by a reference to marginal 3561.

3559 Insert the following new marginal 3559:

(new)

'Approval of salvage packagings

3559 Salvage packagings [see marginal 3510(1)] shall be tested and marked in accordance with the provisions applicable to Packing Group II packagings intended for the carriage of solids or inner packagings, except as follows:

(1) The test substance used in performing the tests shall be water, and the packagings shall be filled to not less than 98 % of 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 marginal 3552(4)(b).

(2) 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 marginal 3560; and

(3) Packagings shall be marked with the letter 'T' as described in marginal 3512(5).'

3560 (Renumbered 3561)

Amend the beginning of the text to read:

'Every packaging intended to contain liquids shall successfully undergo a suitable leakproofness test:

— ...' (rest unchanged)

Annex to appendix A.5

SECTION II

Insert after Class 5.1:

'Class 5.2

Note: tert-butyl hydroperoxide with more than 40 % peroxide content and peroxyacetic acids are excluded from the following items.

<i>Item</i>	<i>Substance</i>	<i>Standard liquid</i>
1°(b), 3°(b), 5°(b), 7°(b), 9°(b), 11°(b), 13°(b), 15°(b), 17°(b), 19°(b)	All organic peroxides in a technically pure form or in solution in solvents which, as far as their compatibility is concerned, are covered by the standard liquid "mixture of hydrocarbons" in this list of section II	Normal butyl acetate/wetting solution with 2 % normal butyl acetate <i>and</i> mixture of hydrocarbons <i>and</i> nitric acid at 55 %

Compatibility of vents and gaskets with organic peroxides may be verified, also independently of the design type test, by laboratory tests with nitric acid.'

APPENDIX A.6

PROVISIONS RELATING TO INTERMEDIATE BULK CONTAINERS (IBCS)

- 3600 In the first sentence delete the word 'semi-rigid'.
- 3601 (7) Add the following new sentence:
'IBCs of type 31HZ2 shall be filled to not less than 80 % of the capacity of the outer casing.'
- (11) Add the following new sentence:
'In addition, IBCs of type 31HZ2 shall only be carried in closed transport units.'
- 3610 (2) Add the following definition:
'Rigid inner receptacle (for composite IBCs) means a receptacle which retains its general shape when empty without its closure in place and without benefit of the outer casing. Any inner receptacle that is not "rigid" is considered to be "flexible".'
- 3611 (1) (a) In the table delete the line 'semi-rigid'.
- 3612 (1) (g) Insert the following:
'The figure "O" shall be affixed to IBCs not designed for stacking.'
- In the paragraph after (h) add the following after 'correctly identified.':
'In addition, the inner receptacle of composite IBCs shall be marked with at least the information prescribed in (d), (e) and (f) above.'
- (2) (q) Add a new subparagraph to read:
'(q) When the outer casing of composite IBCs is demountable each of the demountable elements shall bear a marking conforming to marginal 3612(1) (d) and (f).'
- 3613 Amend to read as follows:
'By affixing marking in accordance with this Appendix it is certified that mass-produced IBCs correspond to the approved design type and that the conditions referred to in the approval certificate have been met.'
- 3614 In tables 1, 2 and 3, delete the line 'semi-rigid ... reserved' under IBCs type 12, 22 and 32.
- 3621 (2) Add after 'carriage':
'including the effect of vibration, or by changes in temperature, humidity or pressure.'
- 3625 (2) (d) Add a new paragraph to read:
'(d) The maximum capacity of IBCs of type 31HZ2 shall be limited to 1,250 litres.'
- (3) Add the following sentence to the end:
'Inner receptacles of IBCs of type 31HZ2 shall comprise at least three layers of film.'
- (4) Add a new paragraph to read:
'(k) The outer casing of an IBC of type 31HZ2 shall fully enclose the inner receptacle.'

3650 (2) Amend to read:

'Before use of each design type a single IBC shall successfully undergo the tests listed in (5) below, in the order mentioned in the table and according to the provisions specified in marginals 3652 to 3660. Separate flexible IBCs may be used for each test. All such tests shall be carried out in accordance with procedures established by the Competent Authority. An IBC design type...' (rest unchanged)

(5) In the table in marginal, in the 'Fibreboard IBCs' column, 'Stacking' entry, insert a footnote ⁽³⁾ to 'X', as follows:

'⁽³⁾ When the IBCs are designed to be stacked.'

Notes (a), (b), (c), (d) and (e) are numbered (1), (5), (6), (2) and (4) respectively.

3651 (2) Amend the first paragraph to read as follows:

'Additional steps shall be taken to ascertain that the plastics material used in the manufacture of rigid plastics IBCs of types 31H1 and 31H2 and composite IBCs of types 31HZ1 and 31HZ2 complies with the provisions of 3624(2) to (4).'

3655 (3) Table

Amend composite IBCs in 24 hour part of the table as follows:

'Composite IBCs with plastics inner receptacle other than 11HH1, 11HH2, 21HH2, 31HH1 and 31HH2.'

Amend the last line to read:

'Composite IBCs with plastics inner receptacle and plastics outer casings of types 11HH1, 11HH2, 21HH2, 31HH1 and 31HH2.'

3658 (2) Amend the last sentence of the fourth sub-paragraph to read as follows:

'Where test samples are prepared in this way, the conditioning specified in marginal 3651 (1) for composite IBCs with fibreboard outer casings may be waived.'

3662 (1) Replace the words 'the leakproofness test' by 'a suitable leakproofness test'.

(4) Add a new paragraph (4) as follows:

'(4) Empty IBCs, uncleaned, may be transported after the date of expiry of their last periodic test, for the purpose of testing.'

3663 Add a new paragraph (3) to read:

'(3) Empty IBCs, uncleaned, may be transported after the date of expiry of their last visual inspection in accordance with (2), for the purpose of inspection.'

Renumber the present (3) and (4) as (4) and (5).

APPENDIX A.7

PROVISIONS RELATING TO RADIOACTIVE MATERIAL OF CLASS 7

3700

Table I

Amend the references to footnotes for the four last Uranium entries as follows:

Symbol of radionuclide	Element and atomic number	A ₁		A ₂	
		TBq	(Ci) [approx. (1)]	TBq	(Ci) [approx. (1)]
U (natural)		Unlimited		Unlimited	
U (enriched 5 % or less)		Unlimited (3)(4)		Unlimited (3)(4)	
U (enriched more than 5 %)		10 (3)(4)	200 (3)(4)	1 × 10 ⁻³ (3)(4)	2 × 10 ⁻² (3)(4)
U (depleted)		Unlimited (4)		Unlimited (4)	

APPENDIX A.9

PROVISIONS RELATING TO DANGER LABELS; EXPLANATION OF SYMBOLS; DANGER LABELS

3900 (1) Insert 'at least' before '100 × 100 mm'.

In the third sentence amend the reference to 'marginal 2224 (6)' to read 'marginal 2224 (3)'.

(2) Amend the beginning to read:

'Label No 11 shall be ...'

3902 Replace the text for label No 10 by 'Reserved' and delete the text for label 12.

3903 Delete '... 10 and 12 ...'

DANGER LABELS

Delete Labels No 10 and 12.

ANNEX B

TABLE OF CONTENTS OF ANNEX B

In the texts for Part I, section 2 and Part III, Appendix B.1a amend 'batteries of receptacles' to read 'battery-vehicles'.

Under Part I, Section 6, add:

'Derogations 10 603

Transitional Provisions 10 604 *et seq.*'

(VOLUME II)

PROVISIONS CONCERNING TRANSPORT EQUIPMENT AND TRANSPORT OPERATIONS

Plan of the Annex

10 000 (1) (c) Amend 'batteries of receptacles' to read 'battery-vehicles'.

Insert: '— Appendix B.4 containing provisions concerning the training of drivers of vehicles carrying dangerous goods'

Add: '— Appendix B.7 for the mark for elevated temperature substances'

PART I

GENERAL PROVISIONS APPLICABLE TO THE CARRIAGE OF DANGEROUS SUBSTANCES OF ALL CLASSES

10 010 Amend to read:

'Annex A exempts from the provisions of this Annex, other than the provisions of marginal 10 381 (1) (a) where applicable, carriage performed under the conditions ...' (rest unchanged)

10 011 Amend as follows:

In Class 1, 'substances' column, first line (maximum total quantity of 50 kg), insert:

'4° (UN Numbers 0081, 0082 and 0241)'

In Class 1, 'substances' column, amend the second line (maximum total quantity of 5 kg) to read:

'2°, 4° (UN Numbers other than 0081, 0082 and 0241), 8°, 11°, 24°'

In Class 3 'substances' column replace '41° to 57°' by '41°'.

	5 kg	20 kg	50 kg	100 kg	333 kg	500 kg	1 000 kg	Un-limited
--	------	-------	-------	--------	--------	--------	----------	------------

Amend the first line in the table to read as follows:

1, 2 (only gases classified under A,O,F), 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 6.2 [only substances of 2° and substances classified under (b)], 8 and 9	Empty packagings (including receptacles, excluding tanks)							×
---	---	--	--	--	--	--	--	---

Amend limited quantities for Class 2 to read as follows:

Gases and articles of 1°, 2°, 4°, 5°, 6° and 7° under A and O							×	
Gases of 3° under A and O					×			
Gases of 1°F							×	
Gases and articles of 2°, 3°, 4°, 5°, 6°, 7° under F					×			
Cyanogen chloride of 2°TC	×							
Phosgene of 2°TC, Fluorine of 1°TOC			×					
Other gases and articles of 1°, 2°, 4°, 5°, 6°, 7° under T, TC, TO, TF, TOC, TFC					×			
Empty packagings of 8° under T, TC, TO, TF, TOC, TFC, or other empty receptacles having contained gases classified under T, TC, TO, TF, TOC or TFC					×			

Replace the two last lines for Class 9 by the following:

Articles of 8° (c)								×
11° (c), 12° (c), 31° (c), 32° (c), 33° (c) and 35° (b)							×	
13° (b) and 34° (c)				×				
20° (c) and 21° (c)						×		

- 10 011 For Class 8, replace the word 'substances' by 'substances and articles' (three times)
(*cont'd*)

Add a note 3 to read:

'Note: 3. For the application of this marginal and its table to samples of Class 1, the provisions applicable to the item number of the substance or article corresponding to the classification code of the samples should be followed.'

Add a 'Note 4' to read as follows:

'Note: 4. In the case of carriage by private individuals, intervention services or by enterprises when such carriage is ancillary to their main activity, see also marginal 10 603.'

- 10 013 Delete.

Definitions

- 10 014 (1) Delete the following definitions:

'fragile package'

'battery of receptacles or battery of tanks'

Amend the following definitions:

Amend the first sentence of the definition for 'container':

'The term "container" means an article of transport equipment (lift van or other similar structure):'

Replace the definition of the term 'tank-container' with the following text:

'The term "tank-container" means an article of transport equipment (including tank swap-bodies) conforming to the definition of the term "container" given above and built to contain liquid, powdery or granular substances but having a capacity of more than 0,45 m³. Tank-containers for substances of Class 2 have a capacity of more than 1 000 l.'

Replace the definition of the term 'battery-vehicle' with the following text:

'The term "battery-vehicle" means a vehicle with an assembly of:

- several cylinders as defined in marginal 2211 (1); or
- several tubes as defined in marginal 2211 (2); or
- several pressure drums as defined in marginal 2211 (3); or
- several bundles of cylinders as defined in marginal 2211 (5); or
- several tanks as defined in this Annex;

interconnected by a manifold, permanently mounted in a frame and permanently fixed to the transport unit.'

In the definitions for the terms 'demountable tank' and 'tank' amend 'a battery of receptacles' to read 'an element of a battery-vehicle'.

- (2) Amend 'batteries of receptacles' to read 'elements of battery-vehicles'.

- 10 015 (1) (b) Amend to read:

'(b) in the case of mixtures of compressed gases: when filled by pressure, the proportion of the volume indicated as a percentage of the total volume of the gaseous mixture, or, when filled by mass, the proportion of the mass indicated as a percentage of the total mass of the mixture;

in the case of mixtures of liquefied gases and gases dissolved under pressure: the proportion of the mass indicated as a percentage of the total mass of the mixture.'

10 118 (2) replace the words 'Substances' by 'Substances and articles'.

(3) Insert the following paragraph:

'However, large containers transported on vehicles whose platforms have insulation and heat-resistant qualities which satisfy those requirements need not then satisfy the said requirements.'

(5) Add a new paragraph (5) as follows:

'Large containers and tank-containers which meet the definition of "container" given in the 1972 International Convention for Safe Containers (CSC, 1972) ⁽¹⁾, as amended or in UIC leaflets ⁽²⁾ 590 (updated 1. 1. 1989) and 592-1 to 592-4 (updated 1. 1. 1994) may not be used to carry dangerous goods unless the large container or the frame of the tank-container satisfies the provisions of the CSC or of UIC leaflets 590 and 592-1 to 592-4.'

Add two footnotes as follows:

'⁽¹⁾ Published by the International Maritime Organization, 4 Albert Embankment, London SE1 7SR.

'⁽²⁾ UIC leaflets are published by the "Union Internationale des chemins de fer, Service Publications — 16, rue Jean Rey — F — 75015 Paris".'

(6) Add a new paragraph (6) as follows:

'A large container may be presented for transport only if it is structurally serviceable.

"Structurally serviceable" means that the container is free from major defects in its structural components, e.g. top and bottom side rails, door sill and header, floor cross members, corner posts, and (in a container) corner fittings. "Major defects" are dents or bends in structural members greater than 19 mm in depth, regardless of length; cracks or breaks in structural members; more than one splice or an improper splice (eg. a lapped splice) in top or bottom end rails or door headers or more than two splices in any one top or bottom side rail or any splice in a door sill or corner post; door hinges and hardware that are seized, twisted, broken, missing or otherwise inoperative; non-closing gaskets and seals; any distortion of the overall configuration sufficient to prevent proper alignment of handling equipment, mounting and securing on a chassis or vehicle.

In addition, deterioration in any component of the container, such as rusted metal in sidewalls or disintegrated fibreglass is unacceptable, regardless of the material of construction. Normal wear, including oxidization (rust), slight dents and scratches and other damage that do not affect serviceability or weather-tightness are, however, acceptable.

Prior to loading the container shall also be checked to ensure that it is free from any residue of a previous load and that the interior floor and walls are free from protrusions.'

10 121 (1) Amend 'batteries of receptacles' to read 'battery-vehicles'.

Section 2 Special requirements to be fulfilled by the means of transport and its equipment

Amend the title above marginal 10 220 to read as follows:

'Tank-vehicles (fixed tanks), battery-vehicles and vehicles used for the carriage of dangerous goods in demountable tanks or in tank-containers of a capacity greater than 3 000 litres'

In Note (a) above 10 220 amend 'batteries of receptacles' to read 'battery-vehicles' (twice).

10 220 (1) Note 2: At the end, add: 'and marginal 212 127 (4) and (5)'.

(2) Amend the reference 'marginal 2200 (3)' to read 'marginal 2200 (5) and (7)'.

Braking

- 10 221 (1) Replace the beginning of paragraph (1) with the following text:

‘Motor vehicles (tractors and rigid vehicles) having a maximum mass exceeding 16 tonnes and trailers (i.e. full trailers, semi-trailers and centre-axle trailers) with a maximum mass exceeding 10 tonnes making up the following types of transport unit: ...’

Delete ‘or batteries of receptacles’ in the existing second indent. Insert ‘battery-vehicles with a capacity of more than 1 000 litres’ as a new second indent.

Add at the end:

‘This provision is applicable also to motor vehicles authorized to tow trailers with a maximum mass exceeding 10 tonnes as above, which have been first registered after 30 June 1995.’

Delete footnote (1).

- (2) In the first sentence, replace the text ‘which includes a motor vehicle and/or trailer’ by ‘which includes a motor vehicle with or without an attached trailer’.

- (4) Add a new paragraph (4) as follows:

‘(4) Each vehicle (motor vehicle or trailer) which forms part of a transport unit of a type not specified in paragraph (1) above, and is first registered after 30 June 1997, shall meet all the relevant technical requirements of ECE Regulation No 13 (1) in their latest amended form applicable at the time of the vehicle approval.’

Add a new footnote as follows:

‘(1) ECE Regulation No 13 (Uniform provisions concerning the approval of vehicles of categories M, N and O with regard to braking), (in its latest amended form) annexed to the Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions (1958 Agreement, as amended). As an alternative, the corresponding provisions of Directive 71/320/EEC (originally published in the Official Journal of the European Communities L 202 of 6. 9. 1971) may apply, provided that they have been amended in accordance with the latest amended form of Regulation No 13 applicable at the time of the vehicle approval.’

- (5) Add a new paragraph as follows:

‘(5) A declaration of conformity of the endurance braking system with marginal 220 522 shall be issued by the vehicle manufacturer. This declaration shall be presented at the first technical inspection mentioned under marginal 10 282 (1).’

- 10 240 (4) Delete.

- 10 251 In the first sentence delete the words ‘and 10 283’, and add ‘(except transport units of type II according to marginal 11 204)’ after ‘is required’.

- (a) Amend to read:

‘Transport units carrying fixed tanks or demountable tanks or tank-containers exceeding 3 000 litres capacity or comprising battery-vehicles with a capacity of more than 1 000 litres transporting either liquids ...’

Amend the reference ‘marginal 2200 (3)’ to read ‘marginal 2200 (5) and (7)’.

Add the following note at the end of the marginal:

‘Note: For transitional provisions see also marginal 10 605.’

10 260 (d) At the end delete the full stop and add the following new text:

‘..., in particular:

(i) for the protection of the driver:

- a warning vest;
- suitable eye protection;
- appropriate respiratory protection when toxic substances are transported;
- suitable gloves;
- suitable footprotection (e.g. boots);
- basic body protection (e.g. apron);
- one handlamp (see also marginal 10353);
- eye wash bottle with water;

(ii) for the protection of the public:

- four reflective self-standing warning signs (e.g. cones, triangles);

(iii) for the protection of the environment:

- cover for sewers and drains resistant to the transported substance;
- a suitable shovel;
- a broom;
- a suitable absorbent;
- a suitable collecting container (only for small amounts).’

10 281 Delete the reference to marginal 10 283.

10 282 (1) Amend the beginning to read as follows:

‘Tank-vehicles, vehicles carrying demountable tanks, battery-vehicles with a capacity of more than 1 000 litres, vehicles intended for the carriage of tank-containers exceeding 3 000 litres capacity, and, where so required...’

Insert ‘annual’ before ‘technical inspections’;

After the words ‘... conform to’ insert the word ‘relevant’.

Add a note, to read:

‘Note: For transitional provisions see also marginal 10 605.’

(3) Delete the word ‘special’.

(4) Amend to read as follows:

‘The validity of a certificate of approval shall expire not later than one year after the date of the technical inspection of the vehicle preceding the issue of the certificate. The next approval term shall however be related to the last nominal expiry date, if the technical inspection is performed within one month before or after that date. However...’ (remainder unchanged)

10 283 Delete.

10 315 Amend to read as follows:

‘(1) Drivers of vehicles carrying dangerous goods in fixed or demountable tanks, drivers of battery-vehicles with a total capacity exceeding 1 000 litres and drivers of vehicles carrying dangerous goods in tank-containers with an individual capacity exceeding 3 000 litres on a transport unit, shall hold a certificate issued by the competent authority or by any organization recognized by that authority stating that they have participated in a training course and passed an examination on the particular requirements that have to be met during carriage of dangerous goods in tanks.’

- 10 315 (cont'd) (2) Drivers of vehicles with a permissible maximum weight exceeding 3 500 kg carrying dangerous goods, other than those referred to in paragraph (1) and, where so required under the provisions of Part II of this Annex, drivers of other vehicles shall hold a certificate issued by the competent authority or by any organization recognized by that authority stating that they have participated in a training course and passed an examination on the particular requirements that have to be met during carriage of dangerous goods other than in tanks.
- (3) By means of appropriate endorsements on his certificate made every five years by the competent authority or by any organization recognized by that authority, a vehicle driver shall be able to show that he has in the year before the date of expiry of his certificate completed a refresher training course and has passed corresponding examinations. The new period of validity shall begin with the date of expiry of the certificate.
- (4) Drivers of vehicles specified in paragraphs (1) and (2) shall attend a basic training course. Training shall be given in the form of courses approved by the competent authority. Its main objectives are to make drivers aware of hazards arising in the carriage of dangerous goods and to give them basic information indispensable for minimizing the likelihood of an incident taking place and, if it does, to enable them to take measures which may prove necessary for their own safety and that of the public and the environment, for limiting the effects of an incident. This training, which shall include individual practical exercises, shall act as the basis of training for all categories of drivers covering at least the subjects defined in marginal 240 102 of Appendix B.4.
- (5) Drivers of vehicles specified in paragraph (1) shall attend a specialization training course for transport in tanks covering at least the subjects defined in marginal 240 103 of Appendix B.4.
- (6) Drivers of vehicles carrying dangerous goods of Class 1 or Class 7 shall attend specialization training courses covering specific requirements for these classes (see marginals 11 315 and 71 315).
- (7) Initial or refresher basic training courses and initial or refresher specialization training courses may be given in the form of comprehensive courses, performed in an integrated way, on the same occasion and by the same training organisation.
- (8) Initial training courses, refresher courses, practical exercises, examinations and the role of competent authorities shall comply with the provisions of Appendix B.4.
- (9) All training certificates conforming to the requirements of this marginal and issued in accordance with the model shown in Appendix B.6 by the competent authority of a Member State or by any organization recognized by that authority shall be accepted during their period of validity by the competent authorities of other Member States.
- (10) The certificate shall be prepared in the language or one of the languages of the country of the competent authority which issued the certificate or recognized the issuing organization and, if this language is not English, French or German, also in English, French or German, except where otherwise provided by agreements concluded between the countries concerned with the transport operation.'

10 321 In the first sentence, delete: 'in an isolated position in the open'.

10 353 (2) Amend the reference 'marginal 2200 (3)' to read 'marginal 2200 (5) and (7)'.

10 378 (1) Amend 'batteries of receptacles' to read 'battery-vehicles'.

10 381 (1) (a) Add at the end: 'and, when appropriate, the container packing certificate prescribed in marginal 2008.'

(2) (a) Delete the reference to 10 283 and the word 'special'.

Instructions in writing

10 385 and heading amend to read as follows:

'Instructions in writing for the driver

10 385
(cont'd)

(1) As a precaution against any accident or emergency that may occur or arise during carriage, the driver shall be given instructions in writing, specifying concisely for each dangerous substance or article carried or for each group of dangerous goods presenting the same dangers to which the substance(s) or article(s) carried belong(s):

- (a) the name of the substance or article or group of goods, the Class and the identification number or for a group of goods the identification numbers of the goods for which these instructions are intended or are applicable;
- (b) the nature of the danger inherent in these goods as well as the measures and personal protection to be applied by the driver;
- (c) the immediate actions to be taken by the driver in the event of an accident.

(2) These instructions shall be provided by the consignor who shall be responsible for their content, in a language the driver(s) taking over the dangerous goods is (are) able to read and to understand, as far as this language is an official language of one of the Member States.

(3) These instructions shall be kept in the driver's cab.

(4) Instructions in writing according to this marginal which are not applicable to the goods which are on board of the vehicle, shall be kept separate from pertinent documents in such a way as to prevent confusion.

(5) The carrier shall ensure that the drivers concerned understand and are capable of carrying out these instructions properly.

(6) In case of mixed loads of packaged goods including dangerous goods which belong to different groups of goods presenting the same dangers, the instructions in writing may be restricted to one instruction per Class of dangerous goods carried on board of the vehicle. In such case no name of goods, nor identification number has to be mentioned in the instructions.

(7) These instructions shall be drafted according to the following format:

LOAD

- Mention of the proper shipping name of the substance or article, or the name of the group of goods presenting the same dangers, the Class and the identification number or for a group of goods the identification numbers of the goods for which these instructions are intended or are applicable.
- Description shall be restricted to e.g. the physical state with indication coloured or not, and mention of a possible odour, to aid identification of leakages or spillages.

NATURE OF DANGER

Short enumeration of dangers:

- Main danger
- Additional dangers inclusive possible delayed effects and dangers for the environment
- Behaviour under fire or heating (decomposition, explosion, development of toxic fumes, ...).

BASIC PERSONAL PROTECTION

Mention of the basic personal protection intended for the driver in accordance with the requirements of marginals 10 260, 11 260, 21 260, 43 260 and 71 260 according to the class(es) of the goods carried.

10 385 IMMEDIATE ACTION BY DRIVER*(cont'd)*

- Notify police and fire brigade
- Stop the engine
- No naked lights. No smoking
- Mark roads and warn other road users
- Keep public away from danger area
- Keep upwind

SPILLAGE

It is considered that drivers of vehicles should be instructed and trained to deal with minor leakages or spillages to prevent their escalation, provided that this can be achieved without personal risk.

Appropriate instructions shall be reminded here as well as the list of equipment in accordance with the requirements of marginals 10 260, 11 260, 21 260, 43 260 and 71 260 according to the class(es) of the goods being carried (e.g. bucket, shovel, ...) which has to be on board of the vehicle to deal with minor leakages or spillages.

FIRE

Drivers should be instructed during training to deal with minor vehicle fires. They shall not attempt to deal with any fire involving the load.

When applicable, it shall be mentioned here that the goods carried react dangerously with water.

FIRST AID

Information for the driver in case he would have been in contact with the transported good(s).

ADDITIONAL INFORMATION'

10 400 Insert a new marginal to read as follows:

- '10 400 (1) The vehicle and its driver, upon arrival at the loading and unloading sites, shall comply with the regulatory provisions (especially those concerning safety, cleanliness and satisfactory operation of the vehicle equipment used in loading and unloading).
- (2) The loading shall not be carried out if an examination of the documents and a visual inspection of the vehicle and its equipment show that the vehicle or the driver do not comply with the regulatory provisions.
- (3) The unloading shall not be carried out, if the above-mentioned inspections reveal deficiencies that might affect the safety of the unloading.'

10 410 Add a new marginal as follows:

'Precautions with respect to foodstuffs, other articles of consumption and animal feeds

Packages, including intermediate bulk containers (IBCs), as well as uncleaned empty packagings, including uncleaned empty intermediate bulk containers (IBCs), bearing labels conforming to models Nos 6.1 or 6.2 and those bearing labels of Class 9, containing substances of 1^o, 2^o(b), 3^o or 13^o(b) of Class 9, shall not be stacked on or loaded in immediate proximity to packages known to contain foodstuffs, other articles of consumption or animal feeds in vehicles and at places of loading, unloading or transhipment.

10 410 When these packages, bearing the said labels, are loaded in immediate proximity of packages known to contain foodstuffs, other articles of consumption or animal feeds, they shall be kept apart from the latter:

(cont'd)

- (a) by complete partitions which should be as high as the packages bearing the said labels, or
- (b) by packages not bearing labels conforming to models Nos 6.1, 6.2 or 9 or packages bearing labels of Class 9 but not containing substances or articles of 1^o, 2^o, 3^o or 13^o of that class, or
- (c) by a space of at least 0,8 m,

unless the packages bearing the said labels are provided with an additional packaging or are completely covered (e.g. by a sheeting, a fibreboard cover or other measures).'

10 414 (3) Delete. Renumber (4) as (3).

Amend the title of section 5 to read:

'Special provisions concerning the operation of vehicles and containers'

10 500 (1) Replace the term 'substances' by 'goods'.

(7) Replace 'batteries of receptacles' by 'battery-vehicles'.

(9) Replace the term 'substances' by 'goods' (twice).

Replace the words 'to the outside' by 'to both sides and at each end'.

Amend the last sentence to read:

'However, label No 11 need not be affixed.'

Add the following note at the beginning of marginal 10 500:

'Note: For marking and labelling of containers and tank-containers for carriage prior to or following maritime transport, see also marginal 2007.'

(10), (12) Replace 'batteries of receptacles' by 'battery-vehicles'.

Other provisions

10 599 Amend to read:

'(1) Subject to the provisions of paragraph (2) below, a Member State may apply to vehicles engaged in the international carriage of dangerous goods by road on its territory certain additional provisions not included in this Part or in Part II of this Annex, provided that those provisions do not conflict with Article 2, paragraph 2 of the Agreement, and are contained in its domestic legislation applying equally to vehicles engaged in the domestic carriage of dangerous goods by road on the territory of that Member State.

(2) Additional provisions falling within the scope of paragraph (1) above are as follows:

- (a) additional safety requirements or restrictions concerning vehicles using certain structures such as bridges or tunnels, vehicles using combined transport modes such as ferries or trains, or vehicles entering or leaving ports or other transport terminals;
- (b) requirements for vehicles to follow prescribed routes to avoid commercial or residential areas, environmentally sensitive areas, industrial zones containing hazardous installations or roads presenting severe physical hazards;
- (c) emergency requirements regarding routing or parking of vehicles carrying dangerous goods resulting from extreme weather conditions, earthquake, accident, industrial action, civil disorder or military hostilities;

10 599 (d) restrictions on movement of dangerous goods traffic on certain days of the week or year.
(*cont'd*)

(3) The competent authority of the Member State applying on its territory any additional provisions within the scope of paragraph 2 (a) and (d) above shall notify the competent service of the European Commission of the additional provisions, which service shall bring them to the attention of the Member States.'

Section 6 Transitional provisions, derogations and provisions peculiar to certain countries

10 602 Add the following sentence after the second sentence of the existing text: Temporary derogations agreed before 1 January 1995 shall not be valid after 31 December 1998 unless renewed.

10 603 Insert a new marginal as follows:

'Derogations

10 603 The provisions laid down in this Annex do not apply:

- (a) to the carriage of dangerous goods by private individuals where the goods in question are packaged for retail sale and are intended for their personal or domestic use or for their leisure or sporting activities;
- (b) to the carriage of machinery or equipment not specified in this Annex and which happen to contain dangerous goods in their internal or operational equipment;
- (c) to carriage undertaken by enterprises which is ancillary to their main activity, such as deliveries to building or civil engineering sites, or in relation to surveying, repairs and maintenance, in quantities of not more than 450 litres per packaging and within the maximum quantities specified in marginal 10 011.

However, carriage undertaken by such enterprises for their supply or external or internal distribution does not fall within the scope of this exemption.
- (d) to carriage undertaken by, or under the supervision of, the intervention services, in particular by breakdown vehicles carrying vehicles which have been involved in accidents or have broken down and contain dangerous goods.
- (e) to emergency transport intended to save human lives or protect the environment provided that all measures are taken to ensure that such transport is carried out in complete safety.'

10 604 Add a new marginal 10 604 and a new heading as follows:

'Transitional Provisions

10 604 The substances and articles of this Directive may be carried until 30 June 1997 in accordance with the requirements of this annex applicable until 31 December 1996. The transport document shall in such cases, bear the inscription "Carriage in accordance with ADR in force before 1 January 1997".'

10 605 Add a new marginal as follows:

'10 605 Transport units intended for the carriage of tank-containers exceeding 3000 litres capacity first registered before 1 July 1997 which do not comply with the requirements of marginal 10 251 and 10 282 may continue to be used until 31 December 2004.

These transport units shall be subject, until that date, to the provisions of marginal 10 283 which were in force until 31 December 1996.'

10 606 Add a new marginal as follows:

'10 606 The provisions of marginals 10 260 and 10 385 which were in force until 31 December 1996 may continue to be applied until 31 December 1998 instead of those which entered into force on 1 January 1997.'

PART II

SPECIAL PROVISIONS APPLICABLE TO THE CARRIAGE OF DANGEROUS
SUBSTANCES OF CLASSES 1 TO 9

CLASS 1

EXPLOSIVE SUBSTANCES AND ARTICLES

11 118 Add the following sentence:

'However, small containers carried on vehicles whose platforms have insulation and heatresistant qualities which satisfy those requirements need not satisfy the said requirements.'

11 204 (3) (a) Add to the end of the last sentence:

'; or the body shall be of a construction which ensures that no flame penetration of the wall or hot spots of more than 120 °C on the inner wall surface will occur within 15 minutes from the start of a fire likely to occur from the operation of the vehicle.'

11 205 Add a new paragraph (3), to read:

'(3) Where substances or articles of Class 1 in quantities requiring a type III transport unit are being carried in containers to or from harbour areas, rail terminals or airports of arrival or departure as part of a multimodal journey, a type II transport unit may be used instead, provided that the containers being carried comply with the appropriate requirements of the IMDG Code, the RID or the ICAO Technical Instructions.'

11 211 Delete.

11 260 Add a new marginal as follows:

'Other equipment

11 260 (1) The equipment mentioned in marginal 10260 (d) iii) is not necessary.

(2) The equipment mentioned in marginal 10260 (d) i) is not necessary except:

- two warning vests
- two handlamps'

11 282 Amend to read:

'The requirements of marginal 10 282 are applicable to Type II and Type III transport units.'

11 315 Amend to read as follows:

'(1) Irrespective of the permissible maximum weight of the vehicle, the requirements of marginal 10 315 apply to drivers of vehicles carrying substances or articles of Class 1.

(2) Drivers of vehicles carrying substances or articles of Class 1 shall attend a specialization training course covering at least the subjects defined in marginal 240 104 of Appendix B.4.

(3) If according to other regulations applicable in a Member State a driver has followed approved equivalent training under a different regime or for a different purpose, covering the subjects referred to in paragraph (2), the specialization course may be, partially or totally, dispensed with.'

11 401 Amend the table under the heading 1.1. as follows:

Division	1.1	
Item	01°	1°-12°
Type I	1,25	50
Type II	6,25	1 000
Type III	18,75	15 000

11 403 (1) Insert a vertical column and a horizontal line 'A', and place 'x' at the intersection of the column and the line.

Renumber existing footnote (1) to (4) and change the reference '(1)' at the intersection of row L and column L to '(4)'.

In the table at the intersection of row B and column D and at the intersection of row D and column B add a reference to the new footnote (1) below.

Add a new footnote (1) to the table as follows:

'(1) Packages containing articles of compatibility group B and substances and articles of compatibility group D may be loaded together on one vehicle provided they are carried in separate containers/compartments of a design approved by the competent authority or a body designated by it, such that there is no danger of transmission of detonation from the articles of compatibility group B to the substances or articles of compatibility group D.'

(2) Add '(except for compatibility group S)' after '1.4'.

11 410 To be deleted.

11 500 (3) Before '4°, Nos 0076 and 0143'

Insert '01°, No 0224'

Add a new paragraph (6) as follows:

'(6) If the size and construction of the vehicle are such that the available surface area is insufficient to affix the labels prescribed in paragraphs (1) to (4), their dimensions may be reduced to 100 mm on each side.'

Replace marginals 21 000 to 30 999 by the following:

CLASS 2

GASES

General

(Only the general provisions of Part I apply)

21 000-
21 099

SECTION 1

MODE OF CARRIAGE

21 100-
21 117

Carriage in containers

21 118 The carriage in small containers of packages containing gases of 3° is prohibited.

21 119-
21 199

SECTION 2

SPECIAL REQUIREMENTS TO BE FULFILLED BY THE MEANS OF TRANSPORT AND ITS EQUIPMENT

21 200-
21 211*Ventilation*

21 212 If packages containing gases of 1^o, 2^o, 3^o or 1001 acetylene, dissolved of 4^oF are carried in a closed vehicle, the vehicle shall be provided with adequate ventilation.

21 213-
21 259*Special equipment*

21 260 (1) When gases or articles designated with letters T, TO, TF, TC, TFC, TOC are being carried, the crew of the vehicle shall be provided with gas-masks enabling them to escape without being affected by dangerous emanations in case of emergency.

(2) The equipment mentioned in marginal 10 260 (d) iii) is not necessary.

21 261-
21 299

SECTION 3

GENERAL SERVICE PROVISIONS

21 300-
21 320*Supervision of vehicles*

21 321 The provisions of marginal 10 321 apply to the dangerous goods listed below in quantities exceeding those specified:

Substances of 1^o other than 1^oA, 1^oO and 1^oF; substances of 2^o other than 2^oA, 2^oO and 2^oF; and substances of 3^oF: 1 000 kg;

Substances of 2^oF, 3^oA and 3^oO: 10 000 kg.

21 322-
21 399

SECTION 4

SPECIAL PROVISIONS CONCERNING LOADING, UNLOADING AND HANDLING

21 400-
21 402*Prohibition of mixed loading on one vehicle*

21 403 Packages bearing a label conforming to models Nos 2, 3 or 6.1 shall not be loaded together on the same vehicle with packages bearing a label conforming to models Nos 1, 1.4 (except for compatibility group S), 1.5, 1.6 or 01.

21 404-
21 413

Handling and stowage

- 21 414 (1) Packages shall not be thrown or subjected to impact.
- (2) Receptacles shall be so stowed in the vehicle that they cannot overturn or fall and that the following requirements are met:
- (a) The cylinders referred to in marginal 2211(1) shall be laid parallel to or at right angles to the longitudinal axis of the vehicle; however, those situated near the forward transverse wall shall be laid at right angles to the said axis.
- Short cylinders of large diameter (about 30 cm and over) may be stowed longitudinally with their valve-protecting devices directed towards the middle of the vehicle.
- Cylinders which are sufficiently stable or are carried in suitable devices effectively preventing them from overturning may be placed upright.
- Cylinders which are laid flat shall be securely and appropriately wedged, attached or secured so that they cannot shift.
- (b) Receptacles containing gases of 3° shall always be placed in the position for which they were designed and be protected against any possibility of being damaged by other packages.

21 415-
21 499

SECTION 5

SPECIAL PROVISIONS CONCERNING THE OPERATION OF VEHICLES AND CONTAINERS

*Marking and labelling of vehicles**Labelling*

- 21 500 Vehicles with fixed or demountable tanks, tank-containers and battery-vehicles containing or having contained (empty, uncleaned) substances of Class 2 shall bear the label(s) indicated below:

Substances of the various items which have been classified under the following groups	Label model Nos
A	2
O	2 + 05
F	3
T	6.1
TF	6.1 + 3
TC	6.1 + 8
TO	6.1 + 05
TFC	6.1 + 3 + 8
TOC	6.1 + 05 + 8

21 501-
21 599

SECTION 6

TRANSITIONAL PROVISIONS, DEROGATIONS AND PROVISIONS PECULIAR TO CERTAIN COUNTRIES

(Only the general provisions of Part I apply)

21 600-
30 999

CLASS 3

FLAMMABLE LIQUIDS

31 321 Replace 'of 41° to 57°' by 'of 41°' (twice).

31 403 Add '(except for compatibility group S)' after '1.4'.

31 410 To be deleted.

Renumber marginals as

31 404-
31 414

31 415 Replace 'of 41° to 57°' by 'of 41°'.

31 500 Renumber existing text as paragraph (1).

Add a new paragraph (2) as follows:

'(2) It is unnecessary to affix the orange-coloured plates prescribed in marginal 10 500 (2) to multi-compartment tank vehicles carrying two or more substances with identification numbers 1202, 1203 or 1223, but no other dangerous substance, if the plates affixed at the front and rear, in accordance with marginal 10 500 (1) bear the identification numbers prescribed in Appendix B.5 for the most hazardous substance carried i.e., the substance with the lowest flashpoint.'

CLASS 4.1

FLAMMABLE SOLIDS

41 111 (1) Amend to read:

'Solid substances and mixtures (such as preparations and wastes) of 6° (c), with the exception of naphthalene, 11° (c), 12° (c), 13° (c) and 14° (c) may be carried in bulk in closed or sheeted vehicles ...' (remainder unchanged).

41 402 Replace 'OP1A, OP1B, OP2A or OP2B' by 'OP1 or OP2'.

41 403 (1) Add '(except for compatibility group S)' after '1.4'.

41 410 To be deleted.

Renumber marginals as

41 404-
41 413

CLASS 4.2

SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION

42 403 Add '(except for compatibility group S)' after '1.4'.

42 410 To be deleted.

Renumber marginals as

42 404-
42 499

CLASS 4.3

SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

43 111 (1) Amend to read:

'Solid substances and mixtures (such as preparations and wastes) of 11° (c), ...' (remainder unchanged).

(2) and (3) Replace 'Aluminium dross' by 'Aluminium smelting by-products or aluminium remelting by-products'.

43 204 Amend the beginning to read:

'Packages containing substances or articles of Class 4.3...'

43 260 Add the following new marginal:

'Other equipment

43 260 In addition to the equipment mentioned in marginal 10 260 a plastic sheet of at least 2 × 3 m shall be carried on board the transport unit.'

43 403 Add '(except for compatibility group S)' after '1.4'.

43 410 To be deleted.

Renumber marginals as

43 404-
43 413

CLASS 5.1

OXIDIZING SUBSTANCES

51 111 (1), (2) Delete '19°'.

51 118 (1) In the first sentence, delete the words 'of fragile packages within the meaning of marginal 10 014 (1) and'.

(2) Delete '19°'.

51 220 (3) Delete.

51 260 Add a new marginal, to read:

'51 260 For the carriage of liquids of 1° (a), the vehicles shall be fitted with a tank placed as securely as possible and having a capacity of about 30 litres of water. An antifreeze preparation which does not attack the skin or the mucous membranes and does not react chemically with the load shall be added to the water. Where the liquids are carried on a tank vehicle trailer that may become separated from the motor vehicle, the water tank shall be placed on the trailer.'

51 403 Add '(except for compatibility group S)' after '1.4'.

51 410 To be deleted.

Renumber marginals as

51 404-
51 413

CLASS 5.2

ORGANIC PEROXIDES

52 118 Delete the words 'Fragile packages within the meaning of marginal 10 014 (1), as well as'.

52 402 Delete all letters A and B after OP1 and OP2.

52 403 (1) Add '(except for compatibility group S)' after '1.4'.

CLASS 6.1

TOXIC SUBSTANCES

61 111 (3) Amend to read:

'(3) Solid mixtures (such as preparations and wastes) containing substances of 60° (c) may be carried under the same conditions as the substances themselves. Other solid substances, including mixtures (such as preparations and wastes) and wastes classified under the letter (c) of the various items may be carried in bulk only in containers under the conditions of marginal 61 118.'

61 118 For 'solid wastes' read 'solid substances, including mixtures (such as preparations or wastes)'.

61 303 To be deleted.

Renumber marginals as

61 303-
61 320

61 403 Add '(except for compatibility group S)' after '1.4'.

61 410 To be deleted.

Renumber marginals as

61 408-
61 414

CLASS 6.2

INFECTIOUS SUBSTANCES

62 240 As a consequence, delete references to 10 240 (4).

62 303 To be deleted.

Renumber marginals as

62 303-
62 320

62 385 (1) (a) For 'in the cases provided for in marginal 10 385 (1)(d)' read 'in case of breakage or deterioration of packagings or of the dangerous substances carried, particularly where such dangerous substances have spilled over the road,'

62 403 (1) To be deleted.

Delete the paragraph number '(2)' and in the corresponding text insert the words '(except for compatibility group S)' after '1.4'.

62 410 To be deleted.

Renumber marginals as

62 404-
62 411

CLASS 7

RADIOACTIVE MATERIAL

71 260 Add the following new marginal:

'Other equipment

71 260 The equipment mentioned in marginal 10 260 (d) iii) is not necessary.'

71 315 Add the following new marginal:

'Special training of drivers

71 315 (1) Irrespective of the permissible maximum weight of the vehicle, the requirements of marginal 10 315 with regard to approved training and the issue of an approved training certificate shall apply to:

(a) drivers of vehicles carrying radioactive material covered by one of Schedules 5 to 8 or 10 to 13;

(b) drivers of vehicles carrying non-fissile radioactive material covered by Schedule 9, if the total number of packages containing radioactive material carried on the vehicle exceeds 10, or where the the sum of the transport indices of the packages carried exceeds 3.

(2) Drivers of vehicles mentioned under (1) above shall attend a specialization training course covering at least the subjects defined in marginal 240 105 of Appendix B.4.

(3) Drivers of vehicles carrying radioactive material covered by Schedule 9, if the total number of packages containing radioactive material carried does not exceed 10, and the sum of the transport indices does not exceed 3, shall receive appropriate training, commensurate with and appropriate to their duties, which provides them with an awareness of the radiation hazards involved in the carriage of radioactive material. Such awareness training shall be confirmed by a certificate provided by their employer.

(4) If, according to other regulations applicable in a Member State, a driver has followed approved equivalent training under a different regime or for a different purpose covering the subjects referred to paragraph (2), the specialization course may be totally or partially dispensed with.'

71 403 Add '(except for compatibility group S)' after '1.4'.

71 500 (1) Replace the third sentence of the paragraph by the following:

'If the size and construction of the vehicle are such that the available surface area is insufficient to affix the label of model No 7 D, its dimensions may be reduced to 100 mm on each side.'

CLASS 8

CORROSIVE SUBSTANCES

81 111 (2) Amend to read:

‘(2) Solid mixtures (such as preparations and wastes) containing substances of 13° may be carried under the same conditions as the substances themselves. Other solid substances, including wastes (such as preparations and wastes) and wastes classified under the letter (c) of the various items may be carried in bulk only in containers under the conditions of marginal 81 118.’

81 112 Add the following new marginal:

‘81 112 (1) Used batteries of 81° (c) may be carried in bulk in specially equipped vehicles.

(2) The load compartments of vehicles shall be of steel resistant to the corrosive substances contained in the batteries. Less resistant steels may be used when there is a sufficiently great wall thickness or a plastic lining/layer resistant to the corrosive substances. The design of the load compartments of vehicles shall take account of any residual currents and impact from the batteries.

Note: Steel exhibiting a maximum rate of progressive reduction of 0,1 mm per year under the effects of the corrosive substances may be considered as resistant.

(3) It shall be ensured by means of constructional measures that there will be no leakage of corrosive substances from the load compartments of vehicles during carriage. Open load compartments shall be covered. The cover shall be resistant to the corrosive substances.

(4) Before loading the load compartments of vehicles including their equipment shall be inspected for damage. Vehicles with damaged load compartments shall not be loaded.

The load compartments of vehicles shall not be loaded above the top of their walls.

(5) No batteries containing different substances and no other goods liable to react dangerously with each other shall be present in the load compartments of vehicles [see marginal 2811 (6)].

During transport no dangerous residue of the corrosive substances contained in the batteries shall adhere to the outer surface of the load compartments of vehicles.’

81 118 Renumber existing text as 81 118 (1), and replace the words ‘or solid wastes classified’ by ‘or solid substances or wastes classified’.

Add the following new paragraph (2):

‘(2) Used batteries of 81° (c) may also be carried in bulk in containers under the conditions in marginal 81 112 (2)-(5). Large containers made of plastics material are not permitted. Small containers made of plastics material shall be able to withstand a drop test from 0,8 m fully loaded, flat on the bottom on to a hard surface at – 18°C without breakage.’

81 403 Add ‘(except for compatibility group S)’ after ‘1.4’.

81 410 To be deleted.

Renumber marginals as

81 404-
81 412

CLASS 9

MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES

- 91 105 Add a note as follows:
'Note: 3268 Airbag inflators and 3268 airbag modules and 3268 seat-belt pretensioners may be transported unpackaged in dedicated handling devices, vehicles or large containers when transported from where they are manufactured to an assembly plant.'
- 91 111 Renumber existing marginal 91 111 to 91 111 (1) and amend the beginning to read:
'2211 polymeric beads, expandable of 4° (c) and solid substances and mixtures (such as preparations and wastes) of 12° (c) ...' (remainder unchanged).
(2) Add a new paragraph (2) to read as follows:
'Substances of 20° (c) for which carriage in tank-vehicles in accordance with Appendix B.1a or tank-containers in accordance with Appendix B.1b is unsuitable because of the high temperature and density of the substance may be carried in special vehicles.
Substances of 21° (c) may be carried in bulk in specially equipped vehicles.
These special vehicles for substances of 20° (c) and specially equipped vehicles for substances of 21° (c) shall be in accordance with standards specified by the competent authority of the country of origin.'
- 91 118 Amend the beginning to read:
'2211 polymeric beads, expandable of 4° (c) and 12° (c) may also be packed...' (remainder unchanged).
- 91 321 Amend to read:
'The provisions of 10 321 apply to the dangerous goods listed below, except those of 35° (b), in quantities...(remainder unchanged).'
- 91 385 (3) (a) For 'in the case of damage to or leakage from a package containing substances of 13°,' read 'in case of breakage or deterioration of packagings or of the dangerous substances carried, particularly where such dangerous substances have spilled over the road,'.
- 91 403 Add '(except for compatibility group S)' after '1.4'.
- 91 407 Amend paragraphs (1) (a) and (b) to read:
'loading or unloading substances classified under (b) of the various items, except 35° (b) ...' (remainder unchanged).
- 91 410 To be deleted.
- Renumber marginals as
- 91 408-
91 413
- 91 415 Amend marginal 91 415 to read:
'If substances or articles of 1°, 2° (b), 3°, 11° (c) or 12° (c) have leaked and been spilled in ...' (remainder unchanged).
- 91 500 Add a new paragraph (3) as follows:
'Special vehicles carrying substances of 20° (c) and specially equipped vehicles carrying substances of 21° (c) shall also bear on two sides and at the rear the mark referred to in Appendix B.7, marginal 270 000.'

PART III

APPENDICES TO ANNEX B

APPENDIX B.1

PROVISIONS COMMON TO THE B.1 APPENDICES

- 200 000 (1) (c) Amend 'batteries of receptacles' to read 'elements of battery-vehicles'.

APPENDIX B.1a

PROVISIONS CONCERNING FIXED TANKS (TANK-VEHICLES), DEMOUNTABLE TANKS
AND BATTERIES OF RECEPTACLES

In the title, the note under the title and the note under Section 1, replace 'batteries of receptacles' by 'battery-vehicles'.

- 211 100 Amend 'batteries of receptacles' to read 'battery-vehicles'.

Add the following note:

'Note: For the purposes of the requirements of this Appendix, the following shall be considered to be substances carried in a liquid state:

- substances which are liquid at normal temperatures and pressures
- solids offered for carriage at elevated temperatures or hot, in the molten state.'

- 211 101 (2) Delete 'or battery of receptacles'.

- 211 102 (1) (a) Amend to read:

"shell" means the sheathing containing the substance (including the openings and their closures);'

- 211 120 First sentence, read:

'Shells shall be designed and constructed in accordance with the provisions of a technical code recognized by the competent authority, in which the material is chosen and the wall thickness determined taking into account maximum and minimum filling and working temperatures, but the following minimum requirements shall be met:'

- (1) Add the following sentence:

'However, suitable non-metallic materials may be used to manufacture equipment and accessories.'

- 211 125 Delete the third introductory sentence.

- (2) Delete.
(3) Renumber as (2).

- 211 127 (2) Read:

'(2) The thickness of the cylindrical wall of the shell and of the ends and cover plates shall not be less than the greater of the values determined by the following formulae:

$$e = \frac{P_{ep} \times D}{2 \times \sigma \times \lambda} \text{ (mm)}$$

$$e = \frac{P_{cal} \times D}{2 \times \sigma} \text{ (mm)}$$

211 127 where:
(*cont'd*)

P_{ep} = test pressure in MPa

P_{cal} = calculation pressure in MPa as specified in marginal 211 123

D = internal diameter of shell in mm

σ = permissible stress, as defined in marginal 211 125 (1) in N/mm²

λ = a coefficient not exceeding or equal to 1, allowing for any weakening due to welds.

The thickness shall in no case be less than that defined in paragraphs (3) to (6) below.'

211 130- Amend 'batteries of receptacles' to read 'battery-vehicles'.
211 151

211 152 Add the following sentence:

'Empty, uncleaned tank-vehicles, demountable tanks and battery-vehicles may be moved after expiration of this period, for undergoing inspection.'

211 179 Add the following sentence:
(*new*)

'Substances which may react dangerously with each other shall not be carried in adjoining compartments of tanks.'

The following are considered dangerous reactions:

- (a) combustion and/or giving off considerable heat
- (b) emission of flammable and/or toxic gases
- (c) formation of corrosive liquids
- (d) formation of unstable substances
- (e) dangerous rise in pressure.

Substances which may react dangerously with each other may be carried in adjoining compartments of tanks, when these compartments are separated by a partition with a wallthickness equal to or greater than that of the tank itself. They may also be carried in compartments of the same tank separated by an empty space or an empty compartment between loaded compartments.'

211 180 Amend 'batteries of receptacles' to read 'battery-vehicles'.

211 181 Replace '7° and 8°' by '3°'.

211 182- Replace 'batteries of receptacles' by 'battery-vehicles'.
211 187

Replace marginals 211 200-211 299 with the following text:

'PART II

SPECIAL REQUIREMENTS SUPPLEMENTING OR MODIFYING THE REQUIREMENTS OF PART I

CLASS 2

GASES

211 200-
211 209

SECTION 1

GENERAL; SCOPE (USE OF TANKS); DEFINITIONS

Use

211 210 The gases of marginal 2201 listed in the tables in marginal 211 251 may be carried in fixed tanks, in demountable tanks, and in battery-vehicles.

211 211-
211 219

SECTION 2

CONSTRUCTION

211 220 (1) Shells intended for the carriage of substances of 1°, 2° or 4° shall be made of steel. In the case of weldless shells, by derogation from marginal 211 125 (3), a minimum elongation at fracture of 14 % and also a stress σ (sigma) lower than or equal to limits hereafter given according to the material may be accepted:

(a) When the ratio R_e/R_m of the minimum guaranteed characteristics after heat treatment is higher than 0,66 without exceeding 0,85:

$$\sigma \leq 0,75 R_e;$$

(b) When the ratio R_e/R_m of the minimum guaranteed characteristics after heat treatment is higher than 0,85:

$$\sigma \leq 0,5 R_m.$$

(2) Receptacles as defined in marginals 2211 (1), (2) and (3) and cylinders as part of bundles of cylinders as defined in marginal 2211 (5) which are elements of a battery-vehicle, shall be constructed according to marginal 2212.

211 221 The requirements of Appendix B.1d apply to the materials and construction of welded shells.

211 222 Shells intended for the carriage of 1017 chlorine or 1076 phosgene of 2°TC shall be designed for a calculation pressure [see marginal 211 127 (2)] of at least 2,2 MPa (22 bar) (gauge pressure).

211 223-
211 229

SECTION 3

ITEMS OF EQUIPMENT

211 230 The discharge pipes of shells shall be capable of being closed by blank flanges or some other equally reliable device. For shells intended for the carriage of gases of 3°, these blank flanges or other equally reliable devices may be fitted with pressure-release openings of a maximum diameter of 1,5 mm.

211 231 Shells intended for the carriage of liquefied gases may be provided with, in addition to the openings prescribed in marginal 211 131, openings for the fitting of gauges, including pressure gauges, and thermometers and with bleed holes, as required for their operation and safety.

211 232 Safety devices shall meet the following requirements:

(1) Filling and discharge openings of shells intended for the carriage of liquefied flammable and/or toxic gases shall be equipped with an instant-closing internal safety device which closes automatically in the event of an unintended movement of the shell or of fire. It shall also be possible to operate the closing device by remote control.

211 232 (2) All openings, other than those accommodating safety valves and than closed bleed holes, of shells
(*cont'd*) intended for the carriage of liquefied flammable and/or toxic gases shall, if their nominal diameter is more than 1,5 mm, be equipped with an internal shut-off device.

(3) By derogation from the provisions of (1) and (2), shells intended for the carriage of deeply-refrigerated flammable and/or toxic liquefied gases may be equipped with external devices in place of internal devices if the external devices afford protection against external damage at least equivalent to that afforded by the wall of the shell.

(4) If the shells are equipped with gauges, the latter shall not be made of a transparent material in direct contact with the substance carried. If there are thermometers, they shall not project directly into the gas or liquid through the shell wall.

(5) Shells intended for the carriage of 1053 hydrogen sulphide or 1064 methyl mercaptan of 2^oTF or 1017 chlorine, 1076 phosgene or 1079 sulphur dioxide of 2^oTC shall not have an opening below the surface level of the liquid. In addition, the cleaning apertures (fist holes) referred to in marginal 211 132 shall not be permitted.

(6) Filling and discharge openings situated in the upper part of shells shall be equipped with, in addition to what is prescribed in (1), a second, external, closing device. This device shall be capable of being closed by a blank flange or some other equally reliable device.

(7) By derogation from the provisions in paragraphs (1), (2) and (6), for receptacles as defined in marginals 2211 (1), (2), (3) and (5) which form a battery-vehicle, the required closing devices may be provided for within the manifold arrangement.

211 233 Safety valves shall meet the following requirements:

(1) Shells intended for the carriage of gases of 1^o, 2^o or 4^o may be provided with not more than two safety valves whose aggregate clear cross-sectional area of passage at the seating or seatings shall be not less than 20 cm² per 30 m³ or part thereof of the receptacle's capacity.

These valves shall be capable of opening automatically at a pressure of between 0,9 and 1,0 times the test pressure of the shell to which they are fitted. They shall be of such a type as to resist dynamic stresses, including liquid surge. The use of dead-weight or counter-weight valves is prohibited.

Shells intended for the carriage of gases of 1^o to 4^o indicated by the letter T in marginal 2201, shall not have safety valves unless the safety valves are preceded by a bursting disc. In the latter case the arrangement of the bursting disc and the safety valve shall be satisfactory to the competent authority.

Where tank-vehicles are intended for carriage by sea, the provisions of this paragraph shall not prohibit the fitting of safety valves conforming to the regulations governing that mode of transport ⁽¹⁾.

(2) Shells intended for the carriage of gases of 3^o shall be equipped with two independent safety valves, each so designed as to allow the gases formed by evaporation during normal operation to escape from the shell in such a way that the pressure does not at any time exceed by more than 10 % the working pressure indicated on the shell. One of the two safety valves may be replaced by a bursting disc which shall be such as to burst at the test pressure. In the event of loss of the vacuum in a double-walled shell, or of destruction of 20 % of the insulation of a single-walled shell, the safety valve and the bursting disc shall permit an outflow such that the pressure in the shell cannot exceed the test pressure.

(3) The safety valves of shells intended for the carriage of gases of 3^o shall be capable of opening at the working pressure indicated on the shell. They shall be so designed as to function faultlessly even at their lowest working temperature. The reliability of their operation at that temperature shall be established and checked either by testing each valve or by testing a specimen valve of each design-type.

⁽¹⁾ These requirements are contained in Section 13 of the General Introduction to the International Maritime Dangerous Goods (IMDG) Code published by the International Maritime Organization, London.

Thermal insulation

211 234 (1) If shells intended for the carriage of gases of 2° are equipped with thermal insulation, such insulation shall consist of either:

- a sun shield covering not less than the upper third but not more than the upper half of the shell surface and separated from the shell by an air space at least 4 cm across; or
- a complete cladding, of adequate thickness, of insulating materials.

(2) Shells intended for the carriage of gases of 3° shall be thermally insulated. Thermal insulation shall be ensured by means of a continuous sheathing. If the space between the shell and the sheathing is under vacuum (vacuum insulation), the protective sheathing shall be so designed as to withstand without deformation an external pressure of at least 100 kPa (1 bar) (gauge pressure). By derogation from marginal 211 102 (2) (a), external and internal reinforcing devices may be taken into account in the calculations. If the sheathing is so closed as to be gas-tight, a device shall be provided to prevent any dangerous pressure from developing in the insulating layer in the event of inadequate gas-tightness of the shell or of its items of equipment. The device shall prevent the infiltration of moisture into the heat-insulating sheath.

(3) Shells intended for the carriage of liquefied gases having a boiling point below -182°C at atmospheric pressure shall not include any combustible material either in the thermal insulation or in the means of attachment to the frame.

The means of attachment for shells of vacuum insulated tanks may, with the approval of the competent authority, contain plastics substances between the shell and the sheathing.

211 235 (1) A battery-vehicle contains elements which are linked to each other by a manifold and permanently fixed to a transport unit. The following elements are considered to be elements of a battery-vehicle:

- cylinders as defined in marginal 2211 (1);
- tubes as defined in marginal 2211 (2);
- pressure drums as defined in marginal 2211 (3);
- bundles of cylinders (also known as frames) as defined in marginal 2211 (5);
- shells as defined in Annex B;

Note: Bundles of cylinders as defined in marginal 2211 (5) which are not elements of a battery-vehicle are subject to the requirements of marginals 2204 to 2224.

(2) The following conditions shall be complied with for battery-vehicles:

- (a) If one of the elements of a battery-vehicle is equipped with a safety valve and shut-off devices are provided between the elements, every element shall be so equipped.
- (b) The filling and discharge devices may be affixed to a manifold.
- (c) Each element of a battery-vehicle, including each individual cylinder of a bundle, as defined in marginal 2211 (5), intended for the carriage of gases designated by capital letter T in marginal 2201, shall be capable of being isolated by a shut-off valve.
- (d) The elements of a battery-vehicle intended for the carriage of gases designated by capital letter F in marginal 2201, when consisting of receptacles as defined in marginals 2211 (1), (2), (3) and (5), shall be combined to groups of not more than 5 000 litres which are capable of being isolated by a shut-off valve.

Each element of a battery-vehicle intended for the carriage of gases designated by capital letter F in marginal 2201 when consisting of shells as defined in Annex B shall be capable of being isolated by a shut-off valve.

(3) The following requirements apply to demountable tanks:

- (a) they shall not be interconnected by a manifold; and
- (b) if the demountable tanks can be rolled, the valves shall be provided with protective caps.

- 211 236 By derogation from the provisions of marginal 211 131, shells intended for the carriage of deeply-refrigerated liquefied gases need not have an inspection aperture.

211 237-
211 239

SECTION 4

TYPE APPROVAL

- 211 240- (No special requirements)
211 249

SECTION 5

TESTS

- 211 250 (1) Receptacles as defined in marginal 2211 (1), (2) and (3) and cylinders as part of bundles of cylinders as defined in marginal 2211 (5), which are elements of a battery-vehicle, shall be tested according to marginal 2219.
- (2) The materials of every welded shell which do not meet the definition of paragraph (1) shall be tested according to the method described in Appendix B.1d.

- 211 251 (1) The test pressure for shells intended for the carriage of gases of 1° having a critical temperature below – 50 °C shall be at least one and one-half times the filling pressure at 15 °C.

- (2) The test pressure for shells intended for the carriage of:

- gases of 1° having a critical temperature of – 50 °C or above; and
- gases of 2° having a critical temperature below 70 °C
- gases of 4°

shall be such that, when the shell is filled to the maximum mass of the contents per litre of capacity, the pressure reached in the shell by the substance at 55 °C for shells with thermal insulation or 65 °C for shells without thermal insulation does not exceed the test pressure.

- (3) The test pressure for shells intended for the carriage of gases of 2° having a critical temperature of 70 °C or above will be:

- (a) If the shell is equipped with thermal insulation, at least equal to the vapour pressure, reduced by 0,1 MPa (1 bar) of the liquid at 60 °C, but not less than 1 MPa (10 bar);
- (b) If the shell is not equipped with thermal insulation, at least equal to the vapour pressure, reduced by 0,1 MPa (1 bar), of the liquid at 65 °C, but not less than 1 MPa (10 bar).

The maximum permissible mass of contents per litre of capacity in kg/litre prescribed for the degree of filling is calculated as follows:

maximum permissible mass of contents
per litre of capacity $= 0,95 \times \text{density of the liquid phase at } 50\text{ °C};$

moreover the vapour phase shall not disappear below 60 °C.

If the shells are not more than 1,5 metre in diameter the values of the test pressure and maximum permissible mass of contents per litre of capacity conforming to marginal 2219 (d) shall be applicable.

- (4) The test pressure for shells intended for the carriage of gases of 3° shall be not less than 1,3 times the maximum permitted working pressure indicated on the shell, but not less than 300 kPa (3 bar) (gauge pressure); for shells with vacuum insulation the test pressure shall be not less than 1,3 times the maximum permitted working pressure increased by 100 kPa (1 bar).

211 251 (5) Table of gases and gas mixtures which may be carried in fixed tanks, demountable tanks or battery-vehicles, minimum test pressure of the shells and as far as applicable, maximum mass of contents per litre of capacity.

In the case of gases and gas mixtures classified under n.o.s. entries, the values of the test pressure and maximum mass of contents per litre of capacity shall be prescribed by the expert approved by the competent authority.

When shells for gases of 1° or 2° having a critical temperature of -50°C or above and below 70°C have been subjected to a test pressure lower than shown in the table, and the shells are fitted with thermal insulation, a lower maximum load may be prescribed by the expert approved by the competent authority, provided that the pressure reached in the shell by the substance at 55°C does not exceed the test pressure stamped on the shell.

Toxic gases and gas mixtures classified under n.o.s. entries with a $\text{LC}_{50} < 200$ ppm shall not be authorized for transport in demountable tanks, fixed tanks or battery-vehicles.

Note: 1001 Acetylene, dissolved, of 4°F shall only be authorized for transport in battery-vehicles.

Item No and group	Identification number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
1°A	1002	AIR, COMPRESSED	See marginal 211 251(1)				
	1006	ARGON, COMPRESSED	See marginal 211 251(1)				
	1046	HELIUM, COMPRESSED	See marginal 211 251(1)				
	1056	KRYPTON, COMPRESSED	See marginal 211 251(1)				
	1065	NEON, COMPRESSED	See marginal 211 251(1)				
	1066	NITROGEN, COMPRESSED	See marginal 211 251(1)				
	1979	RARE GASES MIXTURE, COMPRESSED	See marginal 211 251(1)				
	1980	RARE GASES AND OXYGEN MIXTURE, COMPRESSED	See marginal 211 251(1)				
	1981	RARE GASES AND NITROGEN MIXTURE, COMPRESSED	See marginal 211 251(1)				
	1982	TETRAFLUOROMETHANE, COMPRESSED (REFRIGERANT GAS R 14, COMPRESSED)	20 30	200 300	20 30	200 300	0,62 0,94
	2036	XENON, COMPRESSED	12	120	13	130	1,30 1,24
	2193	HEXAFLUOROETHANE, COMPRESSED (REFRIGERANT GAS R 116, COMPRESSED)	16 20	160 200	20	200	1,10 1,28 1,34
1956	COMPRESSED GAS, N.O.S.	See marginal 211 251(1) or (2)					
1°O	1014	CARBON DIOXIDE AND OXYGEN MIXTURE, COMPRESSED	See marginal 211 251(1)				
	1072	OXYGEN, COMPRESSED	See marginal 211 251(1)				
	3156	COMPRESSED GAS, OXIDIZING, N.O.S.	See marginal 211 251(1) or (2)				

211 251
(cont'd)

Item No and group	Identification number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
1°F	1049	HYDROGEN, COMPRESSED	See marginal 211 251(1)				
	1957	DEUTERIUM, COMPRESSED	See marginal 211 251(1)				
	1962	ETHYLENE, COMPRESSED			22,5 30	225 300	0,34 0,37
			12 22,5	120 225			0,25 0,36
	1971	METHANE, COMPRESSED or NATU- RAL GAS, COMPRESSED with high methane content	See marginal 211 251(1)				
	2034	HYDROGEN AND METHANE MIX- TURE, COMPRESSED	See marginal 211 251(1)				
	2203	SILANE, COMPRESSED (1)	22,5 25	225 250	22,5 25	225 250	0,32 0,41
	1964	HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S.	See marginal 211 251(1) or (2)				
	1954	COMPRESSED GAS, FLAMMABLE, N.O.S	See marginal 211 251(1) or (2)				
	1°T	1612	HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE	See marginal 211 251(1)			
1955		COMPRESSED GAS, TOXIC, N.O.S.	See marginal 211 251(1) or (2) and (2)				
1°TF	1016	CARBON MONOXIDE, COMPRESSED	See marginal 211 251(1)				
	1023	COAL GAS, COMPRESSED	See marginal 211 251(1)				
	1071	OIL GAS, COMPRESSED	See marginal 211 251(1)				
	1911	DIBORANE, COMPRESSED	Not allowed				
	2600	CARBON MONOXIDE AND HYDRO- GEN MIXTURE, COMPRESSED	See marginal 211 251(1)				
	1953	COMPRESSED GAS, TOXIC, FLAM- MABLE, N.O.S.	See marginal 211 251(1) or (2) and (2)				
1°TC	1008	BORON TRIFLUORIDE, COMPRESSED	22,5 30	225 300	22,5 30	225 300	0,715 0,86
	1859	SILICON TETRAFLUORIDE, COM- PRESSED	20 30	200 300	20 30	200 300	0,74 1,1
	2198	PHOSPHORUS PENTAFLUORIDE, COMPRESSED	Not allowed				
	2417	CARBONYL FLUORIDE, COMPRESSED	20 30	200 300	20 30	200 300	0,47 0,7
	3304	COMPRESSED GAS, TOXIC, COR- ROSIVE, N.O.S.	See marginal 211 251 (1) or (2) and (2)				
1°TO	2451	NITROGEN TRIFLUORIDE	20 30	200 300	20 30	200 300	0,5 0,75
	3303	COMPRESSED GAS, TOXIC, OXIDIZ- ING, N.O.S.	See marginal 211 251 (1) or (2) and (2)				

⁽¹⁾ Considered as pyrophoric.⁽²⁾ Allowed if LC₅₀ equal to or greater than 200 ppm.

211 251
(cont'd)

Item No and group	Identi- fication number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
1°TFC	3305	COMPRESSED GAS, TOXIC, FLAM- MABLE, CORROSIVE, N.O.S.	See marginal 211 251(1) or (2) and (1)				
1°TOC	1045	FLUORINE, COMPRESSED	Not allowed				
	1660	NITRIC OXIDE, COMPRESSED	Not allowed				
	2190	OXYGEN DIFLUORIDE	Not allowed				
	3306	COMPRESSED GAS, TOXIC, OXIDIZ- ING, CORROSIVE, N.O.S.	See marginal 211 251 (1) or (2) and (1)				
2°A	1009	BROMOTRIFLUOROMETHANE (REFRIGERANT GAS R 13B1)	12	120	4,2	42	1,13
		12			120	1,44	
		25			250	1,60	
						1,50	
	1013	CARBON DIOXIDE	19 22,5	190 225	19	190	0,66
					25	250	0,75
							0,73
							0,78
	1015	CARBON DIOXIDE AND NITROUS OXIDE MIXTURE	See marginal 211 251 (2) or (3)				
	1018	CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)	2,4	24	2,6	26	1,03
	1020	CHLOROPENTAFLUOROETHANE (REFRIGERANT GAS R 115)	2	20	2,3	23	1,06
	1021	1-CHLORO-1,2,2,2-TETRAFLUORO- ETHANE (REFRIGERANT GAS R 124)	1	10	1,1	11	1,20
	1022	CHLOROTRIFLUOROMETHANE (REFRIGERANT GAS R 13)	12 22,5	120 225	10	100	0,83
					12	120	0,90
					19	190	1,04
					25	250	1,10
							0,96
						1,12	
1028	DICHLORODIFLUOROMETHANE (REFRIGERANT GAS R 12)	1,5	15	1,6	16	1,15	
1029	DICHLOROFLUOROMETHANE (REFRIGERANT GAS R 21)	1	10	1	10	1,23	
1058	LIQUEFIED GASES, non-flammable, char- ged with nitrogen, carbon dioxide or air	1,5 × filling pressure See marginal 211 251(2) or (3)					
1080	SULPHUR HEXAFLUORIDE	12	120	7	70	1,34	
				14	140	1,04	
				16	160	1,33	
						1,37	
1858	HEXAFLUOROPROPYLENE (REFRIGERANT GAS R 1216)	1,7	17	1,9	19	1,11	
1952	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with not more than 9 % ethylene oxide	19 25	190 250	19 25	190 250	0,66 0,75	

⁽¹⁾ Allowed if LC₅₀ equal to or greater than 200 ppm.

211 251
(cont'd)

Item No and group	Identi- fication number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
2°A (cont'd)	1958	1,2-DICHLORO-1,1,2,2-TETRAFLUORO-ETHANE (REFRIGERANT GAS R 114)	1	10	1	10	1,30
	1973	CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUROETHANE MIXTURE with fixed boiling point, with approximately 49 % chlorodifluoromethane (REFRIGERANT GAS R 502)	2,5	25	2,8	28	1,05
	1974	CHLORODIFLUOROBROMOMETHANE (REFRIGERANT GAS R 12B1)	1	10	1	10	1,61
	1976	OCTAFLUOROCYCLOBUTANE (REFRIGERANT GAS R C318)	1	10	1	10	1,34
	1983	1-CHLORO-2,2,2-TRIFLUOROETHANE (REFRIGERANT GAS R 133a)	1	10	1	10	1,18
	1984	TRIFLUOROMETHANE (REFRIGERANT GAS R 23)	19 25	190 250	19 25	190 250	0,92 0,99 0,87 0,95
	2422	OCTAFLUROBUT-2-ENE (REFRIGERANT GAS R 1318)	1,2	12	1,2	12	1,34
	2424	OCTAFLUROPROPANE (REFRIGERANT GAS R 218)	2,5	25	2,5	25	1,09
	2599	CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE, AZEOTROPIC MIXTURE with approximately 60 % chlorotrifluoromethane (REFRIGERANT GAS R 503)	3,1 4,2 10	31 42 100	3,1 4,2 10	31 42 100	0,11 0,21 0,76 0,20 0,66
	2602	DICHLORODIFLUOROMETHANE AND 1,1-DIFLUOROETHANE, AZEOTROPIC MIXTURE with approximately 74 % dichlorodifluoromethane (REFRIGERANT GAS R 500)	1,8	18	2	20	1,01
	3070	ETHYLENE OXIDE AND DICHLORODIFLUOROMETHANE MIXTURE with not more than 12,5 % ethylene oxyde	1,5	15	1,6	16	1,09
	3159	1,1,1,2-TETRAFLUROETHANE (REFRIGERANT GAS R 134a)	1,6	16	1,8	18	1,04
	3220	PENTAFLUROETHANE (REFRIGERANT GAS R 125)	4,1	41	4,9	49	0,95
	3296	HEPTAFLUROPROPANE (REFRIGERANT GAS R 227)	1,5	15	1,5	15	1,20
	3297	ETHYLENE OXIDE AND CHLOROTETRAFLUROETHANE MIXTURE, with not more than 8,8 % ethylene oxide	1	10	1	10	1,16
	3298	ETHYLENE OXIDE AND PENTAFLUROETHANE MIXTURE, with not more than 7,9 % ethylene oxide	2,6	26	2,6	26	1,02
	3299	ETHYLENE OXIDE AND TETRAFLUROETHANE MIXTURE, with not more than 5,6 % ethylene oxide	1,7	17	1,7	17	1,03
	1078	REFRIGERANT GASES, N.O.S. such as					
		MIXTURE F1	1	10	1,1	11	1,23
		MIXTURE F2	1,5	15	1,6	16	1,15
		MIXTURE F3	2,4	24	2,7	27	1,03
		Other mixtures	See marginal 211 251(2) or (3)				

211 251
(cont'd)

Item No and group	Identi- fication number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
2°A (cont'd)	1968 INSECTICIDE GAS, N.O.S. 3163 LIQUEFIED GAS, N.O.S.	See marginal 211 251(2) or (3) See marginal 211 251(2) or (3)					
2°O	1070 NITROUS OXIDE	22,5	225	18 22,5 25	180 225 250	0,78 0,68 0,74 0,75	
	3157 LIQUEFIED GAS, OXIDIZING, N.O.S.	See marginal 211 251 (2) or (3)					
2°F	1010 1,2-BUTADIENE, INHIBITED or	1	10	1	10	0,59	
	1010 1,3-BUTADIENE, INHIBITED or	1	10	1	10	0,55	
	1010 MIXTURES OF 1,3-BUTADIENE AND HYDROCARBONS, INHIBITED	1	10	1	10	0,50	
	1011 BUTANE	1	10	1	10	0,51	
	1012 BUTYLENES MIXTURE or	1	10	1	10	0,50	
	1012 1-BUTYLENE or	1	10	1	10	0,53	
	1012 CIS-2-BUTENE or	1	10	1	10	0,55	
	1012 TRANS-2-BUTYLENE	1	10	1	10	0,54	
	1027 CYCLOPROPANE	1,6	16	1,8	18	0,53	
	1030 1,1-DIFLUOROETHANE (REFRIGER- ANT GAS R 152a)	1,4	14	1,6	16	0,79	
	1032 DIMETHYLAMINE, ANHYDROUS	1	10	1	10	0,59	
	1033 DIMETHYL ETHER	1,4	14	1,6	16	0,58	
	1035 ETHANE	12	120	9,5 12 30	95 120 300	0,32 0,25 0,29 0,39	
	1036 ETHYLAMINE	1	10	1	10	0,61	
	1037 ETHYL CHLORIDE	1	10	1	10	0,80	
	1039 ETHYL METHYL ETHER	1	10	1	10	0,64	
	1041 ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE, with more than 9 % ethylene oxide but not more than 87 %	2,4	24	2,6	26	0,73	
	1055 ISOBUTYLENE	1	10	1	10	0,52	
	1060 METHYLACETYLENE AND PROPADI- ENE MIXTURE, STABILIZED PROPADIENE with 1 % to 4 % methylace- tylene	2,2	22	2,2	22	0,50	
	MIXTURE P1	2,5	25	2,8	28	0,49	
	MIXTURE P2	2,2	22	2,3	23	0,47	
	1061 METHYLAMINE, ANHYDROUS	1	10	1,1	11	0,58	
	1063 METHYL CHLORIDE (REFRIGERANT GAS R 40)	1,3	13	1,5	15	0,81	
	1077 PROPYLENE	2,5	25	2,7	27	0,43	
	1081 TETRAFLUOROETHYLENE, INHIB- ITED	Not allowed					
	1083 TRIMETHYLAMINE, ANHYDROUS	1	10	1	10	0,56	
	1085 VINYL BROMIDE, INHIBITED	1	10	1	10	1,37	
	1086 VINYL CHLORIDE, INHIBITED	1	10	1,1	11	0,81	

211 251
(cont'd)

Item No and group	Identi- fication number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
2°F (cont'd)	1087	VINYL METHYL ETHER, INHIBITED	1	10	1	10	0,67
	1860	VINYL FLUORIDE, INHIBITED	12 22,5	120 225			0,58 0,65 0,64
					25	250	
	1912	METHYLCHLORIDE AND METHYL- ENE CHLORIDE MIXT	1,3	13	1,5	15	0,81
	1959	1,1-DIFLUOROETHYLENE (REFRIGER- ANT GAS R 1132a)	12 22,5	120 225			0,66 0,78 0,77
					25	250	
	1969	ISOBUTANE	1	10	1	10	0,49
	1978	PROPANE	2,1	21	2,3	23	0,42
	2035	1,1,1-TRIFLUOROETHANE (REFRIGER- ANT GAS R 143a)	2,8	28	3,2	32	0,79
	2044	2,2-DIMETHYLPROPANE	1	10	1	10	0,53
	2200	PROPADIENE, INHIBITED	2,2	22	2,2	22	0,50
	2419	BROMOTRIFLUOROETHYLENE	1	10	1	10	1,19
	2452	ETHYLACETYLENE, INHIBITED	1	10	1	10	0,57
	2453	ETHYL FLUORIDE (REFRIGERANT GAS R 161)	3	30	3	30	0,57
	2454	METHYL FLUORIDE (REFRIGERANT GAS R 41)	30	300	30	300	0,36
	2517	1-CHLORO-1,1-DIFLUOROETHANE (REFRIGERANT GAS R 142b)	1	10	1	10	0,99
	2601	CYCLOBUTANE	1	10	1	10	0,63
	3153	PERFLUORO(METHYL VINYL ETHER)	2	20	2	20	0,75
	3154	PERFLUORO(ETHYL VINYL ETHER)	1	10	1	10	0,98
	3252	DIFLUOROMETHANE (REFRIGERANT GAS R 32)	3,9	39	4,5	45	0,78
	1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.					
		MIXTURE A	1	10	1	10	0,50
		MIXTURE A0	1,2	12	1,4	14	0,47
		MIXTURE A1	1,6	16	1,8	18	0,46
		MIXTURE B	2	20	2,3	23	0,43
		MIXTURE C	2,5	25	2,7	27	0,42
		Other mixtures	See marginal 211 251 (2) or (3)				
		3161 LIQUEFIED GAS, FLAMMABLE, N.O.S.	See marginal 211 251 (2) or (3)				
2°F	1062	METHYL BROMIDE	1	10	1	10	1,51
	1581	CHLOROPICRIN AND METHYL BRO- MIDE MIXTURE	Not allowed				
	1582	CHLOROPICRIN AND METHYL CHLORIDE MIXTURE	Not allowed				
	2191	SULPHURY FLUORIDE	5	50	5	50	1,10
	1967	INSECTICIDE GAS, TOXIC, N.O.S.	See marginal 211 251 (2) or (3) and (1)				
	3162	LIQUEFIED GAS, TOXIC, N.O.S.	See marginal 211 251 (2) or (3) and (1)				

⁽¹⁾ Allowed if LC₅₀ equal to or greater than 200 ppm.

211 251
(cont'd)

Item No and group	Identi- fication number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
2°TF	1026	CYANOGEN	10	100	10	100	0,70
	1040	ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1MPa (10 bar) at 50°C	1,5	15	1,5	15	0,78
	1053	HYDROGEN SULPHIDE	4,5	45	5	50	0,67
	1064	METHYL MERCAPTAN	1	10	1	10	0,78
	1082	TRIFLUOROCHLOROETHYLENE, INHIBITED	1,5	15	1,7	17	1,13
	2188	ARSINE	Not allowed				
	2192	GERMANE (¹)	Not allowed				
	2199	PHOSPHINE (¹)	Not allowed				
	2202	HYDROGEN SELENIDE, ANHYDROUS	Not allowed				
	2204	CARBONYL SULPHIDE	2,6	26	2,6	26	0,84
	2676	STIBINE	Not allowed				
	3300	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 87 % ethylene oxide	2,8	28	2,8	28	0,73
	3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.	See marginal 211 251 (2) or (3) (²)				
2°TC	1005	AMMONIA, ANHYDROUS	2,6	26	2,9	29	0,53
	1017	CHLORINE	1,7	17	1,9	19	1,25
	1048	HYDROGEN BROMIDE, ANHYDROUS	5	50	5,5	55	1,54
	1050	HYDROGEN CHLORIDE, ANHY- DROUS	12	120	10 12 15 20	100 120 150 200	0,69 0,30 0,56 0,67 0,74
	1069	NITROSYL CHLORIDE	Not allowed				
	1076	PHOSGENE	Only in battery-vehicles				
	1079	SULPHUR DIOXIDE	1	10	1,2	12	1,23
	1589	CYANOGEN CHLORIDE, INHIBITED	Not allowed				
	1741	BORON TRICHLORIDE	Not allowed				
	2194	SELENIUM HEXAFLUORIDE	Not allowed				
	2195	TELLURIUM HEXAFLUORIDE	Not allowed				
	2196	TUNGSTEN HEXAFLUORIDE	Not allowed				
	2197	HYDROGEN IODIDE, ANHYDROUS	2,3	23	2,3	23	2,25
	2418	SULPHUR TETRAFLUORIDE	Not allowed				
	2420	HEXAFLUOROACETONE	2,2	22	2,2	22	1,08

⁽¹⁾ Considered as pyrophoric.⁽²⁾ Allowed if LC₅₀ equal to or greater than 200 ppm.

211 251
(cont'd)

Item No and group	Identi- fication number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
2°TC (cont'd)	3057	TRIFLUOROACETYL CHLORIDE	1,3	13	1,5	15	1,17
	3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.	See marginal 211 251 (2) or (3) and (1)				
2°TO	3083	PERCHLORYL FLUORIDE	3,3	33	3,3	33	1,21
	3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.	See marginal 211 251 (2) or (3) and (1)				
2°TFC	2189	DICHLOROSILANE	1	10	1	10	0,90
	2534	METHYLCHLOROSILANE	Not allowed				
	3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	See marginal 211 251 (2) or (3) and (1)				
2°TOC	1067	DINITROGEN TETROXIDE (NITRO- GEN DIOXIDE)	Only in battery-vehicles				
	1749	CHLORINE TRIFLUORIDE	3	30	3	30	1,40
	1975	NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURE (NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURE)	Not allowed				
	2548	CHLORINE PENTAFLUORIDE	Not allowed				
	2901	BROMINE CHLORIDE	1	10	1	10	1,50
	3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	See marginal 211 251 (2) or (3) and (1)				
3°A	1913	NEON, REFRIGERATED LIQUID	See marginal 211 251 (4)				
	1951	ARGON, REFRIGERATED LIQUID	See marginal 211 251 (4)				
	1963	HELIUM, REFRIGERATED LIQUID	See marginal 211 251 (4)				
	1970	KRYPTON, REFRIGERATED LIQUID	See marginal 211 251 (4)				
	1977	NITROGEN, REFRIGERATED LIQUID	See marginal 211 251 (4)				
	2187	CARBON DIOXIDE, REFRIGERATED LIQUID	See marginal 211 251 (4)				
	2591	XENON, REFRIGERATED LIQUID	See marginal 211 251 (4)				
	3136	TRIFLUOROMETHANE, REFRIGER- ATED LIQUID	See marginal 211 251 (4)				
	3158	GAS, REFRIGERATED LIQUID, N.O.S.	See marginal 211 251 (4)				
3°O	1003	AIR, REFRIGERATED LIQUID	See marginal 211 251 (4)				
	1073	OXYGEN, REFRIGERATED LIQUID	See marginal 211 251 (4)				
	2201	NITROUS OXIDE, REFRIGERATED LIQUID	See marginal 211 251 (4)				
	3311	GAS, REFRIGERATED, LIQUEFIED, OXIDIZING, N.O.S.	See marginal 211 251 (4)				

⁽¹⁾ Allowed if LC₅₀ equal to or greater than 200 ppm.

211 251
(cont'd)

Item No and group	Identification number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
3°F	1038	ETHYLENE, REFRIGERATED LIQUID					See marginal 211 251 (4)
	1961	ETHANE, REFRIGERATED LIQUID					See marginal 211 251 (4)
	1966	HYDROGEN, REFRIGERATED LIQUID					See marginal 211 251 (4)
	1972	METHANE, REFRIGERATED LIQUID or 1972 NATURAL GAS, REFRIGERATED LIQUID, with high methane content					See marginal 211 251 (4)
	3138	ETHYLENE, ACETYLENE AND PROPYLENE IN MIXTURE, REFRIGERATED LIQUID, containing at least 71,5 % ethylene with not more than 22,5 % acetylene and not more than 6 % propylene					See marginal 211 251 (4)
	3312	GAS,REFRIGERATED, LIQUEFIED, FLAMMABLE, N.O.S.					See marginal 211 251 (4)
4°A	2073	AMMONIA SOLUTIONS, relative density less than 0,88 at 15 °C with more than 35 % and not more than 40 % ammonia	1	10	1	10	0,80
		with more than 40 % and not more than 50 % ammonia	1,2	12	1,2	12	0,77
4°F	1001	ACETYLENE, DISSOLVED					Only in battery vehicles
4°TC	3318	AMMONIA SOLUTIONS, relative density less than 0,880 at 15 °C in water, with more than 50 % ammonia					See marginal 211 251 (2)

211 252 The first hydraulic pressure test shall be carried out before the thermal insulation is placed in position.

211 253 The capacity of each shell intended for the carriage of gases of 1° filled by mass, or gases of 2° or 4° shall be determined, under the supervision of an expert approved by the competent authority, by weighing or volumetric measurement of the quantity of water which fills the shell; any error in the measurement of the shell capacity shall be of less than 1 %. Determination by a calculation based on the dimensions of the shell is not permitted. The maximum filling masses allowed in accordance with marginals 2219 and 211 251 (3) shall be prescribed by an approved expert.

211 254 Checking of the welds shall be carried out in accordance with the lambda-coefficient 1,0 requirements of marginal 211 127 (8).

211 255 By derogation from the requirements of marginal 211 151, the periodic tests shall take place:

(1) Every three years in the case of shells intended for the carriage of 1008 boron trifluoride of 1°TC, 1053 hydrogen sulphide of 2°TF, 1048 hydrogen bromide, anhydrous, 1050 hydrogen chloride, anhydrous, 1017 chlorine, 1076 phosgene or 1079 sulphur dioxide of 2°TC, or 1067 dinitrogen tetroxide (nitrogen dioxide) of 2°TOC;

- 211 255 (2) After 6 years' service and thereafter every 12 years in the case of shells intended for the carriage of gases of 3°. A leakproofness test shall be performed by an approved expert six years after each periodic test.
- (3) Receptacles as defined in marginals 2211 (1), (2) and (3) and cylinders as part of bundles of cylinders as defined in marginal 2211 (5), which are elements of a battery-vehicle, shall have periodic inspections according to marginal 2217.
- 211 256 In the case of vacuum-insulated shells, the hydraulic-pressure test and the check of the internal condition may, with the consent of the approved expert, be replaced by a leakproofness test and measurement of the vacuum.
- 211 257 If apertures have been made, on the occasion of periodic inspections, in shells intended for the carriage of gases of 3°, the method by which they are hermetically closed before the shells are replaced in service shall be approved by the approved expert and shall ensure the integrity of the shell.
- 211 258 Leakproofness test of shells intended for the carriage of gases of 1°, 2° or 4° shall be performed at a pressure of not less than 400 kPa (4 bar) and not more than 800 kPa (8 bar) (gauge pressure).
- 211 259

SECTION 6

MARKING

- 211 260 The following additional particulars shall be marked by stamping or by any other similar method on the plate prescribed in marginal 211 160, or directly on the walls of the shell itself if the walls are so reinforced that the strength of the shell is not impaired:

- (1) On shells intended for the carriage of only one substance:

- the name of the gas in letters in accordance with marginal 2201 and, in addition for gases classified under an n.o.s. entry, the technical name⁽¹⁾.

This indication shall be supplemented in the case of shells intended for the carriage of compressed gases of 1° filled by volume (pressure), by an indication of the maximum filling pressure at 15 °C permitted for the shell, and in the case of shells intended for the carriage of gases of 1° filled by mass, and of gases of 2°, 3° and 4° by the maximum permissible load mass in kg and of the filling temperature if below -20 °C;

- (2) On multi-purpose shells:

- the name of the gas in letters in accordance with marginal 2201 and, in addition for gases classified under an n.o.s. entry, the technical name⁽¹⁾, of the gases for whose carriage the shell is approved.

These particulars shall be supplemented by an indication of the maximum permissible load mass in kg for each gas;

- ⁽¹⁾ The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose. Instead of the technical name the use of one of the following names is permitted:

- For 1078 refrigerant gas, n.o.s., of 2°A: mixture F 1, mixture F 2, mixture F 3;
— For 1060 methyl acetylene and propadiene mixtures, stabilized, of 2°F: mixture P 1, mixture P 2;
— For 1965 hydrocarbon gas mixture, liquefied, n.o.s., of 2°F: mixture A, mixture A 0, mixture A 1, mixture B, mixture C.

The names customary in the trade and mentioned in note 1 under the entry 1965 of 2°F of marginal 2201 may be used only as a complement.

211 260 (3) On shells intended for the carriage of gases of 3° :

(*cont'd*)

— maximum working pressure allowed; and

(4) On shells equipped with thermal insulation:

— the inscription 'thermally insulated' or 'thermally insulated by vacuum'.

211 261 (1) The frame of a battery-vehicle shall bear near the filling point a plate specifying:

— the test pressure of the elements⁽¹⁾;

— the maximum filling pressure⁽¹⁾ at 15 °C allowed for elements intended for compressed gases;

— the number of elements;

— the total capacity⁽¹⁾ of the elements;

— the name of the gas in letters in accordance with marginal 2201 and, in addition for gases classified under an n.o.s. entry, the technical name⁽²⁾;

and, in addition, in the case of liquefied gases:

— the permissible maximum load⁽¹⁾ per element.

(2) Receptacles as defined in marginal 2211 (1), (2), (3) and (5), which are elements of a battery-vehicle, shall be marked according to marginal 2223. These receptacles need not be labelled individually with the danger labels as required in marginal 2224.

Battery-vehicles shall be marked and labelled according to marginal 10 500.

211 262 In addition to the particulars prescribed in marginal 211 161, the following shall be inscribed either on the shell itself or on a plate:

(a) — the inscription: 'minimum filling temperature allowed: ...';

(b) where the shell is intended for the carriage of one substance only:

— the name of the gas in letters in accordance with marginal 2201 and, in addition for gases classified under an n.o.s. entry, the technical name⁽²⁾;

— for gases of 1° filled by mass, and for gases of 2°, 3° and 4°, the maximum permissible load mass in kg;

(c) where the shell is a multi-purpose shell:

— the name of the gas in letters in accordance with marginal 2201 and, in addition for gases classified under an n.o.s. entry, the technical name⁽²⁾ of all the gases to whose carriage the shell is assigned, with an indication of the maximum permissible load mass in kg for each of them;

(d) where the shell is equipped with thermal insulation:

— the inscription 'thermally insulated' or 'thermally insulated by vacuum', in an official language of the country of registration and also, if that language is not English, French or German, in English, French or German, unless any agreements concluded between the countries concerned in the transport operation provide otherwise.

211 263 These particulars shall not be required in the case of a vehicle carrying demountable tanks.

**211 264-
211 269**

⁽¹⁾ The units of measurement should be indicated after numerical values.

⁽²⁾ See footnote ⁽¹⁾ to marginal 211 260.

SECTION 7

OPERATION

211 270 When shells are approved for different gases, a change of use shall include emptying, purging and evacuation operations to the extent necessary for safe operation.

211 271-
211 273

211 274 When loaded tanks or empty but uncleaned tanks are handed over for carriage, only the particulars specified in marginal 211 262 applicable to the gas loaded or just discharged shall be visible; all particulars concerning other gases shall be covered up.

211 275 All the elements of a battery-vehicle shall contain only one and the same gas.

211 276

211 277 The degree of filling of shells intended for the carriage of gases of 3°F shall remain below the level at which, if the contents were raised to a temperature at which the vapour pressure equalled the opening pressure of the safety valve, the volume of the liquid would reach 95 % of the shell's capacity at that temperature.

Shells intended for the carriage of gases of 3°A or 3°O may be filled to 98 % at the loading temperature and the loading pressure.

211 278 In the case of shells intended for the carriage of gases of 3°O, the substances used to ensure leakproofness of the joints or for the maintenance of the closures shall be compatible with the contents.

211 279 The requirement in marginal 211 175 shall not apply to gases of 3°.

SECTION 8

TRANSITIONAL MEASURES

211 280 Fixed tanks (tank-vehicles), demountable tanks and battery-vehicles intended for the carriage of substances of Class 2, built before 1 January 1997, may bear a marking conforming to the provisions of this appendix applicable until 31 December 1996 until the next periodic test.

211 281-
211 299'

CLASS 3

FLAMMABLE LIQUIDS

- 211 310 (b) and (c) Replace '41° to 57°' by '41°'.
- 211 332 At the end of the last sentence after 'flame traps' add the words:
'or the shells shall be explosion-pressure proof.'
- 211 333 Add a new marginal as follows:
'211 333 If the shells are fitted with non-metallic protective linings (inner layers), these shall be so designed that no danger of ignition from electrostatic charges can occur.'
- 211 334 Add the following new marginal:
'211 334 The bottom discharge system of shells intended for the carriage of substances of 61°(c) may consist of an external pipe with a stop-valve, if it is constructed in a metallic material liable to deformation.'
- 211 371 Replace '41° to 57°' by '41°'.
Replace '20°' by '19°'.
- 211 381 (new) Add the following new marginal:
'211 381 Fixed tanks (tank-vehicles) and demountable tanks which were intended for the carriage of substances of 61° (c) of marginal 2301, built before 1 January 1995 according to requirements applicable until that date but which do not conform with the requirements applicable as from 1 January 1995, may still be used until 31 December 2004.'
- 211 382 (new) Add the following new marginal:
'211 382 Fixed tanks (tank-vehicles) and demountable tanks constructed before 1 January 1997 which do not conform to the provisions of marginals 211 332 and 211 333 but were constructed according to the requirements of this Directive in force until that date may still be used.'

CLASS 4.1

FLAMMABLE SOLIDS

CLASS 4.2

SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION

CLASS 4.3

SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

- 211 410 In the note after '14°(c)' replace 'wastes' by 'mixtures (such as preparations and wastes)' and before 'of marginal 2471' insert 'and solid mixtures (such as preparations and wastes) classified under (c) of these items'.

211 460 In the second sentence after 'substances' insert the words 'of marginal 2471'.

211 475 Renumber existing text to 211 475 (1).

Add a new paragraph (2) to read:

'(2) A maximum loading temperature of 80 °C is allowed provided that smoulder spots are prevented during loading and the shells are hermetically closed (2).'

After loading, the shells shall be pressurized (e.g. with compressed air) to check tightness. It shall be ensured that no depressurization takes place during carriage.

Before unloading, it shall be checked if pressure is still above atmospheric. If this is not the case, an inert gas shall be introduced into the shells prior to unloading.'

Add a new footnote as follows:

'(2) See footnote (2) to marginal 211 135.'

CLASS 5.1

OXIDIZING SUBSTANCES

CLASS 5.2

ORGANIC PEROXIDES

211 510 (b) and (d) Add 'or in the molten state' after 'in the liquid state'.

(d) Insert '11°, 13°' between '1°' and '16°'.

211 532 Amend the beginning to read:

'Shells intended for the carriage of substances of 1° or of liquid ammonium nitrate of 20° of marginal 2501 shall be fitted...' (remainder unchanged)

211 540 Add a new marginal as follows:

'211 540 Tanks approved for the carriage of liquid ammonium nitrate of 20° of marginal 2501 shall not be approved for the carriage of organic substances.'

211 571 Amend the last sentence to read:

'In the event of a change of use, shells and equipment shall be thoroughly cleansed of all residues before and after the carriage of substances of 20°.'

CLASS 6.1

TOXIC SUBSTANCES

CLASS 6.2

INFECTIOUS SUBSTANCES

211 610 (b) and (c) Add 'or in the molten state' after 'in the liquid state'.

(b), (c) and (d) Replace '71° to 87°' by '71° to 73°'.

In the Note, replace 'solid wastes' by 'solid substances, including mixtures (such as preparations and wastes)'.

211 680 Add a new marginal as follows:

'SECTION 8

TRANSITIONAL MEASURES

211 680 Fixed tanks, tank-vehicles and demountable tanks intended for the carriage of substances of 6°, 8°, 9°, 10°, 13°, 15°, 16°, 18°, 20°, 25° or 27° of marginal 2601, built before 1 January 1995 in accordance with the requirements of this Appendix applicable until that date, but which do not, however, conform to the requirements applicable as from 1 January 1995, may still be used until 31 December 2000.'

CLASS 8

CORROSIVE SUBSTANCES

211 810 (b) and (c) Add 'or in the molten state' after 'in the liquid state'.

In the note, for 'and solid wastes' read 'and of solid substances, including mixtures (such as preparations and wastes)'.

211 831 Insert 'with the exception of substances of 7°' after '(d)'.

211 870 Add 'or stabilized' after 'inhibited'.

End of the first paragraph, add:

'For the transport of 1829 sulphur trioxide, 99,95 % pure and above, without inhibitor, the temperature of the substance shall be maintained at or above 32,5 °C.'

211 880 Add a new marginal as follows:

'SECTION 8

TRANSITIONAL MEASURES

211 880 Fixed tanks, tank-vehicles and demountable tanks intended for the carriage of substances of 3°, 12°, 33°, 40° or 54° of marginal 2801, built before 1 January 1995 in accordance with the requirements of this Appendix applicable until that date, but which do not, however, conform to the requirements applicable as from 1 January 1995, may still be used until 31 December 2000.'

CLASS 9

MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES

211 910 Amend to read:

'Substances of 1^o, 2^o(b), 11^o(c), 12^o(c), 20^o(c), 31^o to 35^o and 2211 polymeric beads, expandable of 4^o(c) of marginal 2901 may be carried in...(remainder unchanged)

Note: For carriage in bulk of substances of 4^o(c), 12^o(c), 20^o(c) and 21^o(c) of marginal 2901, see marginal 91 111.'

211 920 Amend the beginning to read: 'Shells intended for the carriage of substances of 1^o, 2^o(b), 11^o(c), 12^o(c), 20^o(c), 31^o to 35^o or 2211 polymeric beads, expandable, of 4^o(c) of marginal 2901...'

Add the following sentence:

'The effective minimum thickness of the walls of shells intended for the carriage of substances of 20^o (c) shall not be less than 3 mm.'

211 930 Amend 4^o(c) to read '2211 polymeric beads, expandable of 4^o(c)'.

211 932 Insert a new marginal to read as follows:
(new)

'211 932 Shells intended for the carriage of substances of 20^o(c) shall be equipped with thermal insulation. They may also be equipped with pressure release devices opening automatically inwards or outwards under the effect of a difference of pressure of between 20 kPa and 30 kPa (0,2 bar and 0,3 bar). The thermal insulation directly in contact with the shell intended for the carriage of substances of 20^o (c) shall have an ignition temperature at least 50 °C higher than the maximum temperature for which the shell was designed.'

211 933 Add the following new marginal:
(new)

'211 933 The bottom discharge system of shells intended for the carriage of substances of 20^o (c) may consist of an external pipe with a stop-valve if it is constructed in a metallic material liable to deformation.'

211 934 Add the following new marginal:
(new)

'211 934 Shells intended for the carriage of substances filled at a temperature higher than 190 °C shall be equipped with deflectors placed at right angles to the upper filling openings, so as to avoid a sudden localized increase in wall temperature during filling.'

211 951 Amend the beginning to read: 'Shells intended for the carriage of substances of 1^o, 2^o(b), 11^o(c), 12^o(c), 20^o(c), 31^o to 35^o or 2211 polymeric beads, expandable, of 4^o(c) of marginal 2901...'

211 960 Add a new marginal as follows:
(new)

'Shells intended for the transport of substances of 20^o (c) shall bear on both sides, in addition to the markings stipulated in marginal 211 161, the mark reproduced in Appendix B.7.'

211 980 Add the following new marginal:

‘SECTION 8

TRANSITIONAL MEASURES

211 980 Fixed tanks (tank-vehicles) and demountable tanks intended for the carriage of substances of 20° of marginal 2901, built before 1 January 1997, but which do not conform with the requirements applicable as from 1 January 1995, may still be used until 31 December 2006.’

APPENDIX B.1b

PROVISIONS CONCERNING TANK-CONTAINERS

Notes before 212 100

Delete note 2 in Appendix B.1b, Part I, Section 1.

Replace ‘note 1’ by ‘note’.

212 100 Delete the word ‘gaseous’ and add the following new sentence:

‘For substances of Class 2, the requirements shall apply to tank-containers of more than 1000 l.’

Add the following note:

‘Note: For the purposes of the requirements of this Appendix, the following shall be considered to be substances carried in a liquid state:

- substances which are liquid at normal temperatures and pressures
- solids offered for carriage at elevated temperatures or hot in the molten state.’

212 102 (1) (a) Amend to read:

“‘shell” means the sheathing containing the substance (including the openings and their closures);”

212 120 First sentence, read:

‘Shells shall be designed and constructed in accordance with the provisions of a technical code recognized by the competent authority, in which the material is chosen and the wall thickness determined taking into account maximum and minimum filling and working temperatures, but the following minimum requirements shall be met:’

(1) Add the following sentence:

‘However, suitable non-metallic materials may be used to manufacture equipment and accessories.’

212 125 Delete the third introductory sentence.

(2) Delete.

(3) Renumber as (2).

212 127 (2) Read:

‘(2) The thickness of the cylindrical wall of the shell and of the ends and cover plates shall not be less than the greater of the values determined by the following formulae:

$$e = \frac{P_{ep} \times D}{2 \times \sigma \times \lambda} \text{ (mm)}$$

$$e = \frac{P_{cal} \times D}{2 \times \sigma} \text{ (mm)}$$

where:

P_{ep} = test pressure in MPa

P_{cal} = calculation pressure in MPa as specified in marginal 212 123

D = internal diameter of shell in mm

σ = permissible stress, as defined in marginal 212 125 (1) in N/mm²

λ = a coefficient not exceeding or equal to 1, allowing for any weakening due to welds.

The thickness shall in no case be less than that defined in paragraphs (3) and (4) below.’

212 152 Add the following sentence:

‘Empty, uncleaned tank-containers may be moved after expiration of this period, for undergoing inspection.’

212 178 Add a new marginal as follows:
(new)

‘Substances which may react dangerously with each other shall not be carried in adjoining compartments of tanks:

The following are considered dangerous reactions:

- (a) combustion and/or giving off considerable heat
- (b) emission of flammable and/or toxic gases
- (c) formation of corrosive liquids
- (d) formation of unstable substances
- (e) dangerous rise in pressure.

Substances which may react dangerously with each other may be carried in adjoining compartments of tanks, when these compartments are separated by a partition with a wallthickness equal to or greater than that of the tank itself. They may also be carried in compartments of the same tank separated by an empty space or an empty compartment between loaded compartments.’

Replace marginals 212 200-212 299 with the following text:

‘PART II

SPECIAL REQUIREMENTS SUPPLEMENTING OR MODIFYING THE REQUIREMENTS OF PART I

CLASS 2

GASES

212 200-
212 209

SECTION 1

GENERAL; SCOPE (USE OF TANK-CONTAINERS); DEFINITIONS

Use

212 210 The gases of marginal 2201 listed in the tables in marginal 212 251 may be carried in tankcontainers.

212 211-
212 219

SECTION 2

CONSTRUCTION

212 220 (1) Shells intended for the carriage of substances of 1^o, 2^o or 4^o shall be made of steel. In the case of weldless shells by derogation from marginal 212 125 (3), a minimum elongation at fracture of 14 % and also a stress σ (sigma) lower than or equal to limits hereafter given according to the material may be accepted:

(a) When the ratio R_e/R_m of the minimum guaranteed characteristics after heat treatment is higher than 0,66 without exceeding 0,85:

$$\sigma \leq 0,75 R_e$$

b) When the ratio R_e/R_m of the minimum guaranteed characteristics after heat treatment is higher than 0,85:

$$\sigma \leq 0,5 R_m$$

(2) Receptacles as defined in marginals 2211 (1), (2) and (3) and cylinders as part of bundles of cylinders as defined in marginal 2211 (5) which are elements of a multiple-element tank-container, shall be constructed according to marginal 2212.

212 221 The requirements of Appendix B.1d shall apply to the materials and construction of welded shells.

212 222 Shells intended for the carriage of 1017 chlorine or 1076 phosgene of 2^oTC shall be designed for a calculation pressure [see marginal 212 127 (2)] of at least 2,2 MPa (22 bar) (gauge pressure).

212 223-
212 229

SECTION 3

ITEMS OF EQUIPMENT

212 230 The discharge pipes of shells shall be capable of being closed by blank flanges or some other equally reliable device. For shells intended for the carriage of gases of 3^o, these blank flanges or other equally reliable devices may be fitted with pressure-release openings of a maximum diameter of 1,5 mm.

212 231 Shells intended for the carriage of liquefied gases may, in addition to openings prescribed in marginals 212 131 and 212 132, be provided with openings for the fitting of gauges, thermometers, manometers and with bleed holes, as required for their operational safety.

212 232 Safety devices shall meet the following requirements:

(1) Filling and discharge openings of shells of a capacity exceeding 1 m³ intended for the carriage of liquefied flammable and/or toxic gases shall be equipped with an instant-closing internal safety device which closes automatically in the event of an unintended movement of the tank-container or of fire. It shall also be possible to operate the closing device by remote control.

212 232 (2) All openings, other than those accommodating safety valves and than closed bleed holes, of shells
(*cont'd*) intended for the carriage of liquefied flammable and/or toxic gases shall, if their nominal diameter is more than 1,5 mm, be equipped with an internal shut-off device.

(3) By derogation from the provisions of paragraphs (1) and (2), shells intended for the carriage of deeply refrigerated flammable and/or toxic liquefied gases may be equipped with external devices in place of internal devices if the external devices afford protection against external damage at least equivalent to that afforded by the wall of the shell.

(4) If the shells are equipped with gauges, the latter shall not be made of a transparent material in direct contact with the substance carried. If there are thermometers, they shall not project directly into the gas or liquid through the shell wall.

(5) Shells intended for the carriage of 1053 hydrogen sulphide or 1064 methyl mercaptan of 2°TF or 1017 chlorine, 1076 phosgene or 1079 sulphur dioxide of 2°TC shall not have an opening below the surface level of the liquid. In addition, the cleaning apertures (fist holes) referred to in marginal 212 132 shall not be permitted.

(6) Filling and discharge openings situated in the upper part of shells shall be equipped with, in addition to what is prescribed in paragraph (1) a second, external, closing device. This device shall be capable of being closed by a blank flange or some other equally reliable device.

(7) By derogation from the provisions in paragraphs (1), (2) and (6), for receptacles as defined in marginals 2211 (1), (2), (3) and (5) which form a multiple-element tank-container, the required closing devices may be provided for within the manifold arrangement.

212 233 Safety valves shall meet the following requirements:

(1) Shells intended for the carriage of gases of 1°, 2° or 4° may be fitted with not more than two safety valves whose aggregate clear cross-sectional area of passage at the seating or seatings shall be not less than 20 cm² per 30 m³ or part thereof of the receptacle's capacity. These valves shall be capable of opening automatically under a pressure between 0,9 and 1,0 times the test pressure of the shell to which they are fitted. They shall be of such a type as to resist dynamic stresses, including liquid surge. The use of dead weight or counter weight valves is prohibited.

Shells intended for the carriage of gases of 1° to 4° indicated by the letter T in marginal 2201, shall not have safety valves unless the safety valves are preceded by a bursting disc. In the latter case the arrangement of the bursting disc and the safety valve shall be satisfactory to the competent authority.

Where tank-containers are intended for carriage by sea, the provisions of this paragraph shall not prohibit the fitting of safety valves conforming to the regulations governing that mode of transport⁽¹⁾.

(2) Shells intended for the carriage of gases of 3° shall be fitted with two independent safety valves; each valve shall be so designed as to allow the gases formed by evaporation during normal operation to escape from the shell in such a way that the pressure does not at any time exceed by more than 10 % the working pressure indicated on the shell. One of the two safety valves may be replaced by a bursting disc which shall be such as to burst at the test pressure.

In the event of loss of the vacuum in a double-walled shell, or of destruction of 20 % of the insulation of a single-walled shell, the safety valve and the bursting disc shall permit an outflow such that the pressure in the shell cannot exceed the test pressure.

(3) The safety valves of shells intended for the carriage of gases of 3° shall be capable of opening at the working pressure indicated on the shell. They shall be so designed as to function faultlessly even at the lowest working temperature. The reliability of their operation at that temperature shall be established and checked either by testing each valve or by testing a specimen valve of each design type.

⁽¹⁾ See footnote (1) to marginal 212 190.

Thermal insulation

212 234 (1) If shells intended for the carriage of gases of 2° are equipped with thermal insulation, such insulation shall consist of either:

- a sun shield covering not less than the upper third but not more than the upper half of the shell surface and separated from the shell by an air space at least 4 cm across; or
- a complete cladding, of adequate thickness, of insulating materials.

(2) Shells intended for the carriage of gases of 3° shall be thermally insulated. The thermal insulation shall be protected by means of a continuous sheathing. If the space between the shell and the sheathing is under vacuum (vacuum insulation), the protective sheathing shall be so designed as to withstand without deformation an external pressure of at least 100 kPa (1 bar) (gauge pressure). By derogation from marginal 212 102 (2) (a) external and internal reinforcing devices may be taken into account in the calculations. If the sheathing is so closed as to be gas-tight, a device shall be provided to prevent any dangerous pressure from developing in the insulating layer in the event of inadequate gas-tightness of the shell or of its items of equipment. The device shall prevent the infiltration of moisture into the heat-insulating sheath.

(3) Shells intended for the carriage of liquefied gases having a boiling point below -182°C at atmospheric pressure shall not include any combustible material either in the thermal insulation or in the fastenings.

The fastening for shells of vacuum insulated tanks may, with the approval of the competent authority, contain plastics substances between the shell and the sheathing.

212 235 (1) A multiple-element tank-container contains elements which are linked to each other by a manifold and mounted on the frame of a multiple-element tank-container. The following elements are considered to be elements of a multiple-element tank-container:

- cylinders as defined in marginal 2211 (1);
- tubes as defined in marginal 2211 (2);
- pressure drums as defined in marginal 2211 (3);
- bundles of cylinders (also known as frames) as defined in marginal 2211 (5);
- shells as defined in Annex B.

Note: Bundles of cylinders as defined in marginal 2211 (5) which are not elements of a multiple-element tank-container are subject to the requirements of marginals 2204 to 2224.

(2) The following conditions shall be complied with for multiple-element tank-containers:

- (a) If one of the elements of a multiple-element tank-container is equipped with a safety valve and shut-off devices are provided between the elements, every element shall be so equipped.
- (b) The filling and discharge devices may be affixed to a manifold.
- (c) Each element of a multiple-element tank-container, including each individual cylinder of a bundle, as defined in marginal 2211 (5), intended for the carriage of gases designated by capital letter T in marginal 2201, shall be capable of being isolated by a shut-off valve.
- (d) The elements of a multiple-element tank-container intended for the carriage of gases designated by capital letter F in marginal 2201, when consisting of receptacles as defined in marginals 2211 (1), (2), (3) and (5), shall be combined to groups of not more than 5 000 litres which are capable of being isolated by a shut-off valve.

Each element of a multiple-element tank-container intended for the carriage of gases designated by capital letter F in marginal 2201 when consisting of shells as defined in Annex B shall be capable of being isolated by a shut-off valve.

- 212 236 By derogation from the provisions of marginal 212 131 shells intended for the carriage of deeply-refrigerated liquefied gases need not have an inspection aperture.

212 237-
212 239

SECTION 4

TYPE APPROVAL

- 212 240- (No special requirements)
212 249

SECTION 5

TESTS

- 212 250 (1) Receptacles as defined in marginal 2211 (1), (2) and (3) and cylinders as part of bundles of cylinders as defined in marginal 2211 (5), which are elements of a multiple-element tank-container, shall be tested according to marginal 2219.

(2) The materials of every welded shell which do not meet the definition of paragraph (1) shall be tested according to the method described in Appendix B.1d.

- 212 251 (1) The test pressure for shells intended for the carriage of gases of 1° having a critical temperature below -50° C shall be at least one and one-half times the filling pressure at 15 °C.

(2) The test pressure for shells intended for the carriage of:

- gases of 1° having a critical temperature of -50 °C or above; and
- gases of 2° having a critical temperature below 70 °C
- gases of 4°

shall be such that, when the shell is filled to the maximum mass of the contents per litre of capacity, the pressure reached in the shell by the substance at 55 °C for shells with thermal insulation or 65 °C for shells without thermal insulation does not exceed the test pressure.

(3) The test pressure for shells intended for the carriage of gases of 2° having a critical temperature of 70 °C or above will be:

- (a) If the shell is equipped with thermal insulation, at least equal to the vapour pressure, reduced by 0,1 MPa (1 bar) of the liquid at 60 °C, but not less than 1 MPa (10 bar);
- (b) If the shell is not equipped with thermal insulation, at least equal to the vapour pressure, reduced by 0,1 MPa (1 bar), of the liquid at 65 °C, but not less than 1 MPa (10 bar).

The maximum permissible mass of contents per litre of capacity in kg/litre prescribed for the degree of filling is calculated as follows:

maximum permissible mass of contents per litre of capacity = $0,95 \times$ density of the liquid phase at 50 °C; moreover the vapour phase shall not disappear below 60 °C.

If the shells are not more than 1,5 metre in diameter the values of the test pressure and maximum permissible mass of contents per litre of capacity conforming to marginal 2219 (d) shall be applicable.

(4) The test pressure for shells intended for the carriage of gases of 3° shall be not less than 1,3 times the maximum permitted working pressure indicated on the shell, but not less than 300 kPa (3 bar) (gauge pressure); for shells with vacuum insulation the test pressure shall be not less than 1,3 times the maximum permitted working pressure increased by 100 kPa (1 bar).

212 251 (5) Table of gases and gas mixtures which may be carried in tank-containers, minimum test pressure
(cont'd) of the shells and as far as applicable, maximum mass of contents per litre of capacity.

In the case of gases and gas mixtures classified under n.o.s. entries, the values of the test pressure and maximum mass of contents per litre of capacity shall be prescribed by the expert approved by the competent authority.

When shells for gases of 1° or 2° having a critical temperature of -50 °C or above and below 70 °C have been subjected to a test pressure lower than shown in the table, and the shells are fitted with thermal insulation, a lower maximum load may be prescribed by the expert approved by the competent authority, provided that the pressure reached in the shell by the substance at 55 °C does not exceed the test pressure stamped on the shell.

Toxic gases and gas mixtures classified under n.o.s. entries with a LC₅₀ < 200 ppm shall not be authorized for transport in tank-containers.

Note: 1001 Acetylene, dissolved, of 4°F shall only be authorized for transport in multiple-element tank-containers.

Item No and group	Identification number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
1°A	1002	AIR, COMPRESSED	See marginal 212 251(1)				
	1006	ARGON, COMPRESSED	See marginal 212 251(1)				
	1046	HELIUM, COMPRESSED	See marginal 212 251(1)				
	1056	KRYPTON, COMPRESSED	See marginal 212 251(1)				
	1065	NEON, COMPRESSED	See marginal 212 251(1)				
	1066	NITROGEN, COMPRESSED	See marginal 212 251(1)				
	1979	RARE GASES MIXTURE, COMPRESSED	See marginal 212 251(1)				
	1980	RARE GASES AND OXYGEN MIXTURE, COMPRESSED	See marginal 212 251(1)				
	1981	RARE GASES AND NITROGEN MIXTURE, COMPRESSED	See marginal 212 251(1)				
	1982	TETRAFLUOROMETHANE, COMPRESSED (REFRIGERANT GAS R 14, COMPRESSED)	20 30	200 300	20 30	200 300	0,62 0,94
	2036	XENON, COMPRESSED	12	120	13	130	1,30 1,24
	2193	HEXAFLUOROETHANE, COMPRESSED (REFRIGERANT GAS R 116, COMPRESSED)	16 20	160 200	20	200	1,10 1,28 1,34
1956	COMPRESSED GAS, N.O.S.	See marginal 212 251(1) or (2)					
1°O	1014	CARBON DIOXIDE AND OXYGEN MIXTURE, COMPRESSED	See marginal 212 251(1)				
	1072	OXYGEN, COMPRESSED	See marginal 212 251(1)				
	3156	COMPRESSED GAS, OXIDIZING, N.O.S.	See marginal 211 251(1) or (2)				

212 251
(cont'd)

Item No and group	Identi- fication number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
1°F	1049	HYDROGEN, COMPRESSED	See marginal 212 251(1)				
	1957	DEUTERIUM, COMPRESSED	See marginal 212 251(1)				
	1962	ETHYLENE, COMPRESSED			22,5 30	225 300	0,34 0,37
			12 22,5	120 225			0,25 0,36
	1971	METHANE, COMPRESSED or NATU- RAL GAS, COMPRESSED with high methane content	See marginal 212 251(1)				
	2034	HYDROGEN AND METHANE MIX- TURE, COMPRESSED	See marginal 212 251(1)				
	2203	SILANE, COMPRESSED (1)	22,5 25	225 250	22,5 25	225 250	0,32 0,41
	1964	HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S.	See marginal 212 251(1) or (2)				
	1954	COMPRESSED GAS, FLAMMABLE, N.O.S	See marginal 212 251(1) or (2)				
	1°T	1612	HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE	See marginal 212 251(1)			
1955		COMPRESSED GAS, TOXIC, N.O.S.	See marginal 212 251(1) or (2) and (2)				
1°TF	1016	CARBON MONOXIDE, COMPRESSED	See marginal 212 251(1)				
	1023	COAL GAS, COMPRESSED	See marginal 212 251(1)				
	1071	OIL GAS, COMPRESSED	See marginal 212 251(1)				
	1911	DIBORANE, COMPRESSED	Not allowed				
	2600	CARBON MONOXIDE AND HYDRO- GEN MIXTURE, COMPRESSED	See marginal 212 251(1)				
	1953	COMPRESSED GAS, TOXIC, FLAM- MABLE, N.O.S.	See marginal 212 251(1) or (2) and (2)				
1°TC	1008	BORON TRIFLUORIDE, COMPRESSED	22,5 30	225 300	22,5 30	225 300	0,715 0,86
	1859	SILICON TETRAFLUORIDE, COM- PRESSED	20 30	200 300	20 30	200 300	0,74 1,1
	2198	PHOSPHORUS PENTAFLUORIDE, COMPRESSED	Not allowed				
	2417	CARBONYL FLUORIDE, COMPRESSED	20 30	200 300	20 30	200 300	0,47 0,7
	3304	COMPRESSED GAS, TOXIC, COR- ROSIVE, N.O.S.	See marginal 212 251 (1) or (2) and (2)				
1°TO	2451	NITROGEN TRIFLUORIDE	20 30	200 300	20 30	200 300	0,5 0,75
	3303	COMPRESSED GAS, TOXIC, OXIDIZ- ING, N.O.S.	See marginal 212 251 (1) or (2) and (2)				

⁽¹⁾ Considered as pyrophoric.⁽²⁾ Allowed if LC₅₀ equal to or greater than 200 ppm.

212 251
(cont'd)

Item No and group	Identi- fication number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
1°TFC	3305	COMPRESSED GAS, TOXIC, FLAM- MABLE, CORROSIVE, N.O.S.	See marginal 212 251(1) or (2) and (1)				
1°TOC	1045	FLUORINE, COMPRESSED	Not allowed				
	1660	NITRIC OXIDE, COMPRESSED	Not allowed				
	2190	OXYGEN DIFLUORIDE	Not allowed				
	3306	COMPRESSED GAS, TOXIC, OXIDIZ- ING, CORROSIVE, N.O.S.	See marginal 212 251 (1) or (2) and (1)				
2°A	1009	BROMOTRIFLUOROMETHANE (REFRIGERANT GAS R 13B1)	12	120	4,2	42	1,13
					12	120	1,44
					25	250	1,60
	1013	CARBON DIOXIDE	19 22,5	190 225	19	190	0,66
					25	250	0,75
							0,73
							0,78
	1015	CARBON DIOXIDE AND NITROUS OXIDE MIXTURE	See marginal 212 251 (2) or (3)				
	1018	CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)	2,4	24	2,6	26	1,03
	1020	CHLOROPENTAFLUOROETHANE (REFRIGERANT GAS R 115)	2	20	2,3	23	1,06
	1021	1-CHLORO-1,2,2,2-TETRAFLUORO- ETHANE (REFRIGERANT GAS R 124)	1	10	1,1	11	1,20
	1022	CHLOROTRIFLUOROMETHANE (REFRIGERANT GAS R 13)	12 22,5	120 225	10	100	0,83
					12	120	0,90
					19	190	1,04
					25	250	1,10
							0,96
							1,12
	1028	DICHLORODIFLUOROMETHANE (REFRIGERANT GAS R 12)	1,5	15	1,6	16	1,15
	1029	DICHLOROFLUOROMETHANE (REFRIGERANT GAS R 21)	1	10	1	10	1,23
1058	LIQUEFIED GASES, non-flammable, char- ged with nitrogen, carbon dioxide or air	1,5 × filling pressure See marginal 212 251(2) or (3)					
1080	SULPHUR HEXAFLUORIDE	12	120	7	70	1,34	
				14	140	1,04	
				16	160	1,33	
						1,37	
1858	HEXAFLUOROPROPYLENE (REFRIGERANT GAS R 1216)	1,7	17	1,9	19	1,11	
1952	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with not more than 9 % ethylene oxide	19	190	19	190	0,66	
		25	250	25	250	0,75	

(1) Allowed if LC₅₀ equal to or greater than 200 ppm.

212 251
(cont'd)

Item No and group	Identi- fication number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)	
			With thermal insulation		Without thermal insulation			
			MPa	bar	MPa	bar		
2 ^o A (cont'd)	1958	1,2-DICHLORO-1,1,2,2-TETRA-FLUO-ROETHANE (REFRIGERANT GAS R 114)	1	10	1	10	1,30	
	1973	CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE with fixed boiling point, with approximately 49 % chlorodifluoromethane (REFRIGERANT GAS R 502)	2,5	25	2,8	28	1,05	
	1974	CHLORODIFLUOROBROMO-METHA-NE (REFRIGERANT GAS R 12B1)	1	10	1	10	1,61	
	1976	OCTAFLUOROCYCLOBUTANE (REFRIGERANT GAS RC 318)	1	10	1	10	1,34	
	1983	1-CHLORO-2,2,2-TRIFLUOROETHANE (REFRIGERANT GAS R 133a)	1	10	1	10	1,18	
	1984	TRIFLUOROMETHANE (REFRIGER-ANT GAS R 23)	19 25	190 250	19 25	190 250	0,92 0,99 0,87 0,95	
	2422	OCTAFLUOROBUT-2-ENE (REFRIGER-ANT GAS R 1318)	1,2	12	1,2	12	1,34	
	2424	OCTAFLUOROPROPANE (REFRIGER-ANT GAS R 218)	2,5	25	2,5	25	1,09	
	2599	CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE, AZEOTROPIC MIXTURE with approximately 60 % chlorotrifluoromethane (REFRIGERANT GAS R 503)	3,1 4,2 10	31 42 100	3,1 4,2 10	31 42 100	0,11 0,21 0,76 0,20 0,66	
	2602	DICHLORODIFLUOROMETHANE AND 1,1-DIFLUOROETHANE, AZEO-TROPIC MIXTURE with approximately 74 % dichlorodifluoromethane (REFRI-GERANT GAS R 500)	1,8	18	2	20	1,01	
	3070	ETHYLENE OXIDE AND DICHLORO-DIFLUOROMETHANE MIXTURE with not more than 12,5 % ethylene oxyde	1,5	15	1,6	16	1,09	
	3159	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)	1,6	16	1,8	18	1,04	
	3220	PENTAFLUOROETHANE (REFRIGER-ANT GAS R 125)	4,1	41	4,9	49	0,95	
	3296	HEPTAFLUOROPROPANE (REFRIGER-ANT GAS R 227)	1,5	15	1,5	15	1,20	
	3297	ETHYLENE OXIDE AND CHLOROTE-TRAFLUOROETHANE MIXTURE, with not more than 8,8 % ethylene oxide	1	10	1	10	1,16	
	3298	ETHYLENE OXIDE AND PENTAFLUO-ROETHANE MIXTURE, with not more than 7,9 % ethylene oxide	2,6	26	2,6	26	1,02	
	3299	ETHYLENE OXIDE AND TETRAFLUO-ROETHANE MIXTURE, with not more than 5,6 % ethylene oxide	1,7	17	1,7	17	1,03	
	1078	REFRIGERANT GASES, N.O.S. such as MIXTURE F1 MIXTURE F2 MIXTURE F3 Other mixtures	1 1,5 2,4	10 15 24	1,1 1,6 2,7	11 16 27	1,23 1,15 1,03	
	See marginal 212 251(2) or (3)							

212 251
(cont'd)

Item No and group	Identi- fication number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
2 ^o A (<i>cont'd</i>)	1968 INSECTICIDE GAS, N.O.S. 3163 LIQUEFIED GAS, N.O.S.	See marginal 212 251(2) or (3) See marginal 212 251(2) or (3)					
2 ^o O	1070 NITROUS OXIDE 3157 LIQUEFIED GAS, OXIDIZING, N.O.S.	22,5	225	18 22,5 25	180 225 250	0,78 0,68 0,74 0,75	
		See marginal 212 251 (2) or (3)					
2 ^o F	1010 1,2-BUTADIENE, INHIBITED or 1010 1,3-BUTADIENE, INHIBITED or 1010 MIXTURES OF 1,3-BUTADIENE AND HYDROCARBONS, INHIBITED 1011 BUTANE 1012 BUTYLENES MIXTURE or 1012 1-BUTYLENE or 1012 CIS-2-BUTENE or 1012 TRANS-2-BUTYLENE 1027 CYCLOPROPANE 1030 1,1-DIFLUOROETHANE (REFRIGER- ANT GAS R 152a) 1032 DIMETHYLAMINE, ANHYDROUS 1033 DIMETHYL ETHER 1035 ETHANE 1036 ETHYLAMINE 1037 ETHYL CHLORIDE 1039 ETHYL METHYL ETHER 1041 ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE, with more than 9 % ethylene oxide but not more than 87 % 1055 ISOBUTYLENE 1060 METHYLACETYLENE AND PROPADI- ENE MIXTURE, STABILIZED PROPADIENE with 1 % to 4 % methylace- tylene MIXTURE P1 MIXTURE P2 1061 METHYLAMINE, ANHYDROUS 1063 METHYL CHLORIDE (REFRIGERANT GAS R 40) 1077 PROPYLENE 1081 TETRAFLUOROETHYLENE, INHIB- ITED 1083 TRIMETHYLAMINE, ANHYDROUS 1085 VINYL BROMIDE, INHIBITED 1086 VINYL CHLORIDE, INHIBITED	1 1 1 1 1 1 1 1,6 1,4 1 1,4 12 1 1 1 2,4 1 2,2 2,5 2,2 1 1,3 2,5 1 1 1	10 10 10 10 10 10 10 16 14 10 14 120 10 10 10 24 10 22 25 22 10 13 25 10 10 10	1 1 1 1 1 1 1 1,8 1,6 1			

212 251
(cont'd)

Item No and group	Identi- fication number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
2°F (cont'd)	1087	VINYL METHYL ETHER, INHIBITED	1	10	1	10	0,67
	1860	VINYL FLUORIDE, INHIBITED	12 22,5	120 225			0,58 0,65 0,64
					25	250	
	1912	METHYLCHLORIDE AND METHYL- ENE CHLORIDE MIXT	1,3	13	1,5	15	0,81
	1959	1,1-DIFLUOROETHYLENE (REFRIGER- ANT GAS R 1132a)	12 22,5	120 225			0,66 0,78 0,77
					25	250	
	1969	ISOBUTANE	1	10	1	10	0,49
	1978	PROPANE	2,1	21	2,3	23	0,42
	2035	1,1,1-TRIFLUOROETHANE (REFRIGER- ANT GAS R 143a)	2,8	28	3,2	32	0,79
	2044	2,2-DIMETHYLPROPANE	1	10	1	10	0,53
	2200	PROPADIENE, INHIBITED	2,2	22	2,2	22	0,50
	2419	BROMOTRIFLUOROETHYLENE	1	10	1	10	1,19
	2452	ETHYLACETYLENE, INHIBITED	1	10	1	10	0,57
	2453	ETHYL FLUORIDE (REFRIGERANT GAS R 161)	3	30	3	30	0,57
	2454	METHYL FLUORIDE (REFRIGERANT GAS R 41)	30	300	30	300	0,36
	2517	1-CHLORO-1,1-DIFLUOROETHANE (REFRIGERANT GAS R 142b)	1	10	1	10	0,99
	2601	CYCLOBUTANE	1	10	1	10	0,63
	3153	PERFLUORO(METHYL VINYL ETHER)	2	20	2	20	0,75
	3154	PERFLUORO(ETHYL VINYL ETHER)	1	10	1	10	0,98
	3252	DIFLUOROMETHANE (REFRIGERANT GAS R 32)	3,9	39	4,5	45	0,78
	1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.					
		MIXTURE A	1	10	1	10	0,50
		MIXTURE A0	1,2	12	1,4	14	0,47
		MIXTURE A1	1,6	16	1,8	18	0,46
		MIXTURE B	2	20	2,3	23	0,43
		MIXTURE C	2,5	25	2,7	27	0,42
		Other mixtures	See marginal 212 251 (2) or (3)				
		3161 LIQUEFIED GAS, FLAMMABLE, N.O.S.	See marginal 212 251 (2) or (3)				
2°F	1062	METHYL BROMIDE	1	10	1	10	1,51
	1581	CHLOROPICRIN AND METHYL BRO- MIDE MIXTURE	Not allowed				
	1582	CHLOROPICRIN AND METHYL CHLORIDE MIXTURE	Not allowed				
	2191	SULPHURY FLUORIDE	5	50	5	50	1,10
	1967	INSECTICIDE GAS, TOXIC, N.O.S.	See marginal 212 251 (2) or (3) and (1)				
	3162	LIQUEFIED GAS, TOXIC, N.O.S.	See marginal 212 251 (2) or (3) and (1)				

(1) Allowed if LC₅₀ equal to or greater than 200 ppm.

212 251
(cont'd)

Item No and group	Identi- fication number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
2°TF	1026	CYANOGEN	10	100	10	100	0,70
	1040	ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1MPa (10 bar) at 50°C	1,5	15	1,5	15	0,78
	1053	HYDROGEN SULPHIDE	4,5	45	5	50	0,67
	1064	METHYL MERCAPTAN	1	10	1	10	0,78
	1082	TRIFLUOROCHLOROETHYLENE, INHIBITED	1,5	15	1,7	17	1,13
	2188	ARSINE	Not allowed				
	2192	GERMANE ⁽¹⁾	Not allowed				
	2199	PHOSPHINE ⁽¹⁾	Not allowed				
	2202	HYDROGEN SELENIDE, ANHYDROUS	Not allowed				
	2204	CARBONYL SULPHIDE	2,6	26	2,6	26	0,84
	2676	STIBINE	Not allowed				
	3300	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 87 % ethylene oxide	2,8	28	2,8	28	0,73
	3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.	See marginal 212 251 (2) or (3) ⁽²⁾				
2°TC	1005	AMMONIA, ANHYDROUS	2,6	26	2,9	29	0,53
	1017	CHLORINE	1,7	17	1,9	19	1,25
	1048	HYDROGEN BROMIDE, ANHYDROUS	5	50	5,5	55	1,54
	1050	HYDROGEN CHLORIDE, ANHY- DROUS	12	120	10 12 15 20	100 120 150 200	0,69 0,30 0,56 0,67 0,74
	1069	NITROSYL CHLORIDE	Not allowed				
	1076	PHOSGENE	Only in multiple-element tank-containers				
	1079	SULPHUR DIOXIDE	1	10	1,2	12	1,23
	1589	CYANOGEN CHLORIDE, INHIBITED	Not allowed				
	1741	BORON TRICHLORIDE	Not allowed				
	2194	SELENIUM HEXAFLUORIDE	Not allowed				
	2195	TELLURIUM HEXAFLUORIDE	Not allowed				
	2196	TUNGSTEN HEXAFLUORIDE	Not allowed				
	2197	HYDROGEN IODIDE, ANHYDROUS	2,3	23	2,3	23	2,25
	2418	SULPHUR TETRAFLUORIDE	Not allowed				
	2420	HEXAFLUOROACETONE	2,2	22	2,2	22	1,08

⁽¹⁾ Considered as pyrophoric.⁽²⁾ Allowed if LC₅₀ equal to or greater than 200 ppm.

212 251
(cont'd)

Item No and group	Identi- fication number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
2°TC (cont'd)	3057	TRIFLUOROACETYL CHLORIDE	1,3	13	1,5	15	1,17
	3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.	See marginal 212 251 (2) or (3) and (1)				
2°TO	3083	PERCHLORYL FLUORIDE	3,3	33	3,3	33	1,21
	3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.	See marginal 212 251 (2) or (3) and (1)				
2°TFC	2189	DICHLOROSILANE	1	10	1	10	0,90
	2534	METHYLCHLOROSILANE	Not allowed				
	3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	See marginal 212 251 (2) or (3) and (1)				
2°TOC	1067	DINITROGEN TETROXIDE (NITRO- GEN DIOXIDE)	Only in multiple-element tank-containers				
	1749	CHLORINE TRIFLUORIDE	3	30	3	30	1,40
	1975	NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURE (NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURE)	Not allowed				
	2548	CHLORINE PENTAFLUORIDE	Not allowed				
	2901	BROMINE CHLORIDE	1	10	1	10	1,50
	3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	See marginal 212 251 (2) or (3) and (1)				
3°A	1913	NEON, REFRIGERATED LIQUID	See marginal 212 251 (4)				
	1951	ARGON, REFRIGERATED LIQUID	See marginal 212 251 (4)				
	1963	HELIUM, REFRIGERATED LIQUID	See marginal 212 251 (4)				
	1970	KRYPTON, REFRIGERATED LIQUID	See marginal 212 251 (4)				
	1977	NITROGEN, REFRIGERATED LIQUID	See marginal 212 251 (4)				
	2187	CARBON DIOXIDE, REFRIGERATED LIQUID	See marginal 212 251 (4)				
	2591	XENON, REFRIGERATED LIQUID	See marginal 212 251 (4)				
	3136	TRIFLUOROMETHANE, REFRIGER- ATED LIQUID	See marginal 212 251 (4)				
	3158	GAS, REFRIGERATED LIQUID, N.O.S.	See marginal 212 251 (4)				
3°O	1003	AIR, REFRIGERATED LIQUID	See marginal 212 251 (4)				
	1073	OXYGEN, REFRIGERATED LIQUID	See marginal 212 251 (4)				
	2201	NITROUS OXIDE, REFRIGERATED LIQUID	See marginal 212 251 (4)				
	3311	GAS, REFRIGERATED, LIQUEFIED, OXIDIZING, N.O.S.	See marginal 212 251 (4)				

(1) Allowed if LC₅₀ equal to or greater than 200 ppm.

212 251
(cont'd)

Item No and group	Identification number	Name of the substance	Minimum test pressure for shells				Max. filling ratio (kg/l)
			With thermal insulation		Without thermal insulation		
			MPa	bar	MPa	bar	
3°F	1038	ETHYLENE, REFRIGERATED LIQUID	See marginal 212 251 (4)				
	1961	ETHANE, REFRIGERATED LIQUID	See marginal 212 251 (4)				
	1966	HYDROGEN, REFRIGERATED LIQUID	See marginal 212 251 (4)				
	1972	METHANE, REFRIGERATED LIQUID or 1972 NATURAL GAS, REFRIGERATED LIQUID, with high methane content	See marginal 212 251 (4)				
	3138	ETHYLENE, ACETYLENE AND PROPYLENE IN MIXTURE, REFRIGERATED LIQUID, containing at least 71,5 % ethylene with not more than 22.5 % acetylene and not more than 6 % propylene	See marginal 212 251 (4)				
	3312	GAS,REFRIGERATED, LIQUEFIED, FLAMMABLE, N.O.S.	See marginal 212 251 (4)				
4°A	2073	AMMONIA SOLUTIONS, relative density less than 0,88 at 15 °C with more than 35 % and not more than 40 % ammonia	1	10	1	10	0,80
		with more than 40 % and not more than 50 % ammonia	1,2	12	1,2	12	0,77
4°F	1001	ACETYLENE, DISSOLVED	Only in multiple-element tank-containers				
4°TC	3318	AMMONIA SOLUTIONS, relative density less than 0,880 at 15 °C in water, with more than 50 % ammonia	See marginal 212 251 (2)				

212 252 The first hydraulic pressure test shall be carried out before the thermal insulation is placed in position.

212 253 The capacity of each shell intended for the carriage of gases of 1° filled by mass, or gases of 2° or 4° shall be determined, under the supervision of an expert approved by the competent authority, by weighing or volumetric measurement of the quantity of water which fills the shell; any error in the measurement of shell capacity shall be of less than 1 %. Determination by a calculation based on the dimensions of the shell is not permitted. The maximum filling masses allowed in accordance with marginals 2219 and 212 251 (3) shall be prescribed by an approved expert.

212 254 Checking of the welds shall be carried out in accordance with the lambda-coefficient 1,0 requirements of marginal 212 127 (6).

212 255 By derogation from the requirements of marginal 212 151, the periodic tests shall take place:

(1) Every two and a half years in the case of shells intended for the carriage of 1008 boron trifluoride of 1°TC, 1053 hydrogen sulphide of 2°TF, 1048 hydrogen bromide, anhydrous, 1050 hydrogen chloride, anhydrous, 1017 chlorine, 1076 phosgene or 1079 sulphur dioxide of 2°TC, or 1067 dinitrogen tetroxide (nitrogen dioxide) of 2°TOC;

- 212 255 (2) After 8 years' service and thereafter every 12 years in the case of shells intended for the carriage of gases of 3°. A leakproofness test may be performed, at the request of the competent authority, between any two successive tests.
- (3) Receptacles as defined in marginals 2211 (1), (2) and (3) and cylinders as part of bundles of cylinders as defined in marginal 2211 (5), which are elements of a multiple-element tank-container, shall have periodic inspections according to marginal 2217.
- 212 256 In the case of vacuum-insulated shells, the hydraulic-pressure test and the check of the internal condition may, with the consent of the approved expert, be replaced by a leakproofness test and measurement of the vacuum.
- 212 257 If apertures have been made, on the occasion of periodic inspections, in shells intended for the carriage of gases of 3°, the method by which they are hermetically closed before the shells are replaced in service shall be approved by the approved expert and shall ensure the integrity of the shell.
- 212 258 Leakproofness test of shells intended for the carriage of gases of 1°, 2° or 4° shall be performed at a pressure of not less than 400 kPa (4 bar) and not more than 800 kPa (8 bar) (gauge pressure).
- 212 259

SECTION 6

MARKING

- 212 260 The following additional particulars shall be marked by stamping or by any other similar method on the plate prescribed in marginal 212 160, or directly on the walls of the shell itself if the walls are so reinforced that the strength of the shell is not impaired:

- (1) On shells intended for the carriage of only one substance:

- the name of the gas in letters in accordance with marginal 2201 and, in addition for gases classified under an n.o.s. entry, the technical name ⁽¹⁾.

This indication shall be supplemented in the case of shells intended for the carriage of compressed gases of 1° filled by volume (pressure), by an indication of the maximum filling pressure at 15 °C permitted for the shell, and in the case of shells intended for the carriage of gases of 1° filled by mass, and of gases of 2°, 3° and 4° by the maximum permissible load mass in kg and of the filling temperature if below – 20 °C;

- (2) On multi-purpose shells:

- the name of the gas in letters in accordance with marginal 2201 and, in addition for gases classified under an n.o.s. entry, the technical name ⁽¹⁾, of the gases for whose carriage the shell is approved.

These particulars shall be supplemented by an indication of the maximum permissible load mass in kg for each gas;

- (3) On shells intended for the carriage of gases of 3° :

- the working pressure; and

- (4) On shells equipped with thermal insulation:

- the inscription 'thermally insulated' or 'thermally insulated by vacuum'.

⁽¹⁾ The technical name shall be a name currently used in scientific and technical handbooks, journals and texts. Trade names shall not be used for this purpose. Instead of the technical name the use of one of the following names is permitted:

- For 1078 refrigerant gas, n.o.s., of 2°A: mixture F1, mixture F2, mixture F3;
- For 1060 methyl acetylene and propadiene mixtures, stabilized, of 2°F: mixture P1, mixture P2;
- For 1965 hydrocarbon gas mixture, liquefied, n.o.s., of 2°F: mixture A, mixture A0, mixture A1, mixture B, mixture C.

The names customary in the trade and mentioned in note 1 under the entry 1965 of 2°F of marginal 2201 may be used only as a complement.

- 212 261 (1) The frame of a multiple-element tank-container shall bear near the filling point a plate specifying:
- the test pressure of the elements ⁽¹⁾;
 - the maximum filling pressure ⁽¹⁾ at 15 °C allowed for elements intended for compressed gases;
 - the number of elements;
 - the total capacity ⁽¹⁾ of the elements;
 - the name of the gas in letters in accordance with marginal 2201 and, in addition for gases classified under an n.o.s. entry, the technical name ⁽²⁾;
- and, in addition, in the case of liquefied gases:
- the permissible maximum load ⁽¹⁾ per element.

(2) Receptacles as defined in marginal 2211 (1), (2), (3) and (5), which are elements of a multiple-element tank-container, shall be marked according to marginal 2223. These receptacles need not be labelled individually with the danger labels as required in marginal 2224.

Multiple-element tank-containers shall be marked and labelled according to marginal 10 500.

- 212 262 In addition to the particulars prescribed in marginal 212 161, the following shall be inscribed either on the tank-container itself or on a plate:

- (a) the inscription: 'minimum filling temperature allowed: ...';
- (b) where the shell is intended for the carriage of one substance only:
 - the name of the gas in letters in accordance with marginal 2201 and, in addition for gases classified under an n.o.s. entry, the technical name ⁽²⁾;
 - for gases of 1^o filled by mass, and for gases of 2^o, 3^o and 4^o, the maximum permissible load mass in kg;
- (c) where the shell is a multi-purpose shell:
 - the name of the gas in letters in accordance with marginal 2201 and, in addition for gases classified under an n.o.s. entry, the technical name ⁽²⁾ of all the gases to whose carriage the shell is assigned, with an indication of the maximum permissible load mass in kg for each of them;
- (d) where the shell is equipped with thermal insulation:
 - the inscription 'thermally insulated' or 'thermally insulated by vacuum', in an official language of the country of registration and also, if that language is not English, French or German, in English, French or German, unless any agreements concluded between the countries concerned in the transport operation provide otherwise.

212 263-
212 269

SECTION 7

OPERATION

- 212 270 When shells are approved for different gases, a change of use shall include emptying, purging and evacuation operations to the extent necessary for safe operation.

212 271-
212 273

⁽¹⁾ The units of measurement should be indicated after numerical values.

⁽²⁾ See footnote ⁽¹⁾ to marginal 212 260.

- 212 274 When loaded tanks or empty but uncleaned tanks are handed over for carriage, only the particulars specified in marginal 212 262 applicable to the gas loaded or just discharged shall be visible; all particulars concerning other gases shall be covered up.
- 212 275 All the elements of a multiple-element tank-container shall contain only one and the same gas.
- 212 276
- 212 277 The degree of filling of shells intended for the carriage of gases of 3°F shall remain below the level at which, if the contents were raised to a temperature at which the vapour pressure equalled the opening pressure of the safety valve, the volume of the liquid would reach 95 % of the shell's capacity at that temperature.
- Shells intended for the carriage of gases of 3°A or 3°O may be filled to 98 % at the loading temperature and the loading pressure.
- 212 278 In the case of shells intended for the carriage of gases of 3°O, the substances used to ensure leakproofness of the joints or for the maintenance of the closures shall be compatible with the contents.
- 212 279 The requirement in marginal 212 175 shall not apply to gases of 3°.

SECTION 8

TRANSITIONAL MEASURES

- 212 280 Tank-containers intended for the carriage of substances of Class 2, built before 1 January 1997, may bear a marking conforming to the provisions of this appendix applicable until 31 December 1996 until the next periodic test.
- 212 281-
212 299'

CLASS 3

FLAMMABLE LIQUIDS

- 212 310 (b) and (c) Replace '41° to 57°' by '41°'.
- 212 332 At the end of the last sentence after 'flame traps' add the words: 'or the shells shall be explosion-pressure proof.'
- 212 333 Add a new marginal as follows:
- '212 333 If the shells are fitted with non-metallic protective linings (inner layers), these shall be so designed that no danger of ignition from electrostatic charges can occur.'
- 212 334 Add the following new marginal:
- '212 334 The bottom discharge system of shells intended for the carriage of substances of 61°(c) may consist of an external pipe with a stop-valve, if it is constructed in a metallic material liable to deformation.'
- 212 371 Replace '41° to 57°' by '41°'.
- Replace '20°' by '19°'.
- 212 381 Add the following new marginal:
- '212 381 Tank-containers which were intended for the carriage of substances of 61° (c) of marginal 2301, built before 1 January 1995, but which do not conform with the requirements applicable as from 1 January 1995, may still be used until 31 December 2004.'

212 382 Add the following new marginal:

'212 382 Tank-containers, constructed before 1 January 1997 which do not conform to the provisions of marginals 212 332 and 212 333 but were constructed according to the requirements of this Directive in force until that date, may still be used.'

CLASS 4.1

FLAMMABLE SOLIDS

CLASS 4.2

SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION

CLASS 4.3

SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

212 410 In the note after '14°(c)' replace 'wastes' by 'mixtures (such as preparations and wastes)' and before 'of marginal 2471' insert 'and solid mixtures (such as preparations and wastes) classified under (c) of these items'.

212 460 In the second sentence after 'substances' insert the words 'of marginal 2471'.

212 475 Renumber existing text to 212 475 (1).

Add a new paragraph (2) to read:

'(2) A maximum loading temperature of 80 °C is allowed provided that smoulder spots are prevented during loading and the shells are hermetically closed (2).

After loading, the shells shall be pressurized (e.g. with compressed air) to check tightness. It shall be ensured that no depressurization takes place during carriage.

Before unloading, it shall be checked if pressure is still above atmospheric. If this is not the case, an inert gas shall be introduced into the shells prior to unloading.'

Add a new footnote as follows:

'(2) See footnote (1) to marginal 212 135.'

CLASS 5.1

OXIDIZING SUBSTANCES

CLASS 5.2

ORGANIC PEROXIDES

212 510 (b) and (d) Add 'or in the molten state' after 'in the liquid state'. (d) Insert '11°, 13°' between '1°' and '16°'.

212 540 At the end amend the word 'other' to read 'organic'.

212 571 Amend the last sentence to read:

'In the event of a change of use, shells and equipment shall be thoroughly cleansed of all residues before and after the carriage of substances of 20°.'

CLASS 6.1

TOXIC SUBSTANCES

CLASS 6.2

INFECTIOUS SUBSTANCES

- 212 610 (1) (b) and (c) Add 'or in the molten state' after 'in the liquid state'.
(b), (c) and (d) Replace '71° to 87°' by '71° to 73°'.

In the Note, replace 'solid wastes' by 'solid substances, including mixtures (such as preparations and wastes)'.

212 680 Add a new marginal as follows:

'SECTION 8

TRANSITIONAL MEASURES

- 212 680 Tank-containers intended for the carriage of substances of 6°, 8°, 9°, 10°, 13°, 15°, 16°, 18°, 20°, 25° or 27° of marginal 2601, built before 1 January 1995 in accordance with the requirements of this Appendix applicable until that date, but which do not, however, conform to the requirements applicable as from 1 January 1995, may still be used until 31 December 1999.'

CLASS 8

CORROSIVE SUBSTANCES

- 212 810 (b) and (c) Add 'or in the molten state' after 'in the liquid state'.

In the note, for 'and solid wastes and' read 'of' and after 'identification number 3244' insert 'and of solid substances, including mixtures (such as preparations and wastes)'.

- 212 831 Insert 'with the exception of substances of 7°' after '(d)'.

- 212 870 Add 'or stabilized' after 'inhibited'.

End of the first paragraph, add:

'For the transport of 1829 sulphur trioxide, 99,95 % pure and above, without inhibitor, the temperature of the substance shall be maintained at or above 32,5 °C.'

- 212 880 Add a new marginal as follows:

'SECTION 8

TRANSITIONAL MEASURES

- 212 880 Tank-containers intended for the carriage of substances of 3°, 12°, 33°, 40° or 54° of marginal 2801, built before 1 January 1995 in accordance with the requirements of this Appendix applicable until that date, but which do not, however, conform to the requirements applicable as from 1 January 1995, may still be used until 31 December 1999.'

CLASS 9

MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES

212 910 Amend to read:

‘Substances of 1°, 2°(b), 11°(c), 12°(c), 20°(c), 31°(c) to 35°(c) or 2211 polymeric beads, expandable of 4°(c) of marginal 2901 may be carried in...(remainder unchanged)

Note: For carriage in bulk of substances of 4°(c), 12°(c), 20°(c), 21°(c), 31°, 32° or 35° of marginal 2901, see marginal 91 111.’

212 920 Amend the beginning to read:

‘Shells intended for the carriage of substances of 1°, 2°(b), 11°(c), 12°(c), 20°(c), 31° to 35° or 2211 polymeric beads, expandable, of 4°(c) of marginal 2901...’

212 930 Amend 4°(c) to read ‘polymeric beads, expandable of 4°(c)’.

212 932
(new) Insert a new marginal to read as follows:

‘212 932 Shells intended for the carriage of substances of 20°(c) shall be equipped with thermal insulation. They may also be equipped with pressure release devices opening automatically inwards or outwards under the effect of a difference of pressure of between 20 kPa and 30 kPa (0,2 bar and 0,3 bar). The thermal insulation directly in contact with the shell intended for the carriage of substances of 20° (c) shall have an ignition temperature at least 50 °C higher than the maximum temperature for which the shell was designed.’

212 933
(new) Add the following new marginal:

‘212 933 The bottom discharge system of shells intended for the carriage of substances of 20° (c) may consist of an external pipe with a stop-valve if it is constructed in a metallic material liable to deformation.’

212 951 Amend the beginning to read:

‘Shells intended for the carriage of substances of 1°, 2°(b), 11°(c), 12°(c), 20°(c), 31° to 35° or 2211 polymeric beads, expandable, of 4°(c) of marginal 2901...’

212 960
(new) Add a new marginal as follows:

‘Shells intended for the carriage of substances of 20° (c) shall bear on both sides, in addition to the markings stipulated in marginal 212 161, the mark reproduced in Appendix B.7.’

212 980 Add the following new marginal:

‘SECTION 8

TRANSITIONAL MEASURES

212 980 Tank-containers which were intended for the carriage of substances of 20° of marginal 2901, built before 1 January 1997 but which do not conform with the requirements of this Appendix applicable as from 1 January 1997, may still be used until 31 December 2006.’

APPENDIX B.1c

PROVISIONS CONCERNING FIXED TANKS AND DEMOUNTABLE TANKS MADE OF REINFORCED PLASTICS

In note 1 below the title amend ‘batteries of receptacles’ to read ‘battery-vehicles’.

APPENDIX B.1d

**REQUIREMENTS CONCERNING THE MATERIALS AND CONSTRUCTION OF WELDED
FIXED TANKS, OF WELDED DEMOUNTABLE TANKS AND OF SHELLS OF WELDED TANK-
CONTAINERS, INTENDED FOR THE CARRIAGE OF DEEPLY-REFRIGERATED LIQUEFIED
GASES OF CLASS 2**

214 250 (1) Amend to read as follows:

‘Shells intended for the carriage of substances of Class 2, 1^o, 2^o and 4^o, Class 4.2, 6^o (a), 17^o (a), 19^o (a) and 31^o (a) to 33^o (a), or Class 8, 6^o, shall be made of steel.’

(2) Amend to read as follows:

‘For shells constructed of fine-grained steels for the carriage of:

- substances of Class 2 which are classified as corrosive and substances of 4^oA of marginal 2201, and
- substances of marginal 2801, 6^o

the steel shall have a guaranteed yield strength of not more than 460 N/mm² and a maximum ultimate tensile strength of 725 N/mm². Such shells shall be heat-treated for thermal stress relief.’

214 251 In (a) 1. replace ‘7^o and 8^o’ by ‘3^o’.

APPENDIX B.2

**UNIFORM PROVISIONS CONCERNING THE CONSTRUCTION OF VEHICLES INTENDED
FOR THE CARRIAGE OF DANGEROUS GOODS INCLUDING PROVISIONS FOR THEIR
TYPE-APPROVAL WHERE APPROPRIATE**

220 100 Delete the words ‘, 10 283, and to “type II” transport units according to marginal 11 204(2)’.

220 301 (2) Amend the definitions for Types FL, OX and AT as follows:

‘TYPE FL: for vehicles intended for the carriage of liquids with a flash-point of not more than 61 °C or flammable gases, in tank-containers of more than 3 000 litres capacity, fixed tanks or demountable tanks and for battery vehicles of more than 1 000 litres capacity intended for the carriage of flammable gases;

TYPE OX: for vehicles intended for the carriage of substances of class 5.1, marginal 2501, item 1^o (a) in tank-containers of more than 3 000 litres capacity, fixed tanks or demountable tanks;

TYPE AT: for vehicles, other than those of types FL or OX, intended for the carriage of dangerous goods in tank-containers of more than 3 000 litres capacity, fixed tanks or demountable tanks, and for battery vehicles of more than 1 000 litres capacity other than those of type FL.’

220 403 In footnote (1), add the following numbers:

‘29 for Estonia, 32 for Latvia, 33 for Liechtenstein, 34 for Bulgaria, 35 (reserved), 36 for Lithuania’

220 500 (Correction), add an ‘X’ at the intersection of the row ‘220 531 (-cab: thermal shield)’ with column ‘OX’.

Add an ‘X’ at the intersection of the row ‘220 520 (Braking)’ with each column.

220 511 (1) Add to the list of exempted circuits:

‘— from the battery to the electrical lifting mechanism for lifting the bogie axle.’

220 514 Delete the second sentence.

220 520 Replace 'ECE Regulation No 13⁽¹⁾ or the Directive 71/320/EEC⁽²⁾' with 'ECE Regulation No 13⁽¹⁾'.

Amend footnote ⁽¹⁾ to read:

'ECE Regulation No 13 (Uniform provisions concerning the approval of vehicles of categories M, N and O with regard to braking), (in its latest amended form) annexed to the Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions (1958 Agreement, as amended). As an alternative, the corresponding provisions of Directive 71/320/EEC (originally published in the Official Journal of the European Communities L 202 of 6. 9. 1971) may apply, provided that they have been amended in accordance with the latest amended form of ECE Regulation No 13 applicable at the time of the vehicle approval.'

Delete footnote ⁽²⁾.

220 521 (1) and (2) Delete 'or to Directive 71/320/EEC⁽²⁾'.

250 522 (2) (b), (e), (f) and (3) Delete the reference to Directive 71/320/EEC and delete footnote ⁽²⁾.

220 536 Auxiliary heating for the cab shall be sufficiently secure from the standpoint of fire prevention and shall be placed forward of the protective wall (rear wall of the cab). The heating appliance shall be placed as far forward and as high as possible (at least 80 cm above ground level) and shall be fitted with devices preventing any object from being brought into contact with the hot surfaces of the appliance or its exhaust pipe. Only appliances with a means of rapidly restarting the combustion air ventilator (max. 20 s) may be used.

220 540 Replace 'ECE Regulation No 89⁽¹⁾ or of Directives 92/6/EEC and 92/24/EEC' by 'ECE Regulation No 89⁽²⁾'.

Add a footnote ⁽²⁾ to read as follows:

'⁽²⁾ ECE Regulation No 89 [Uniform provisions concerning the approval of: I. vehicles with regard to limitation of their maximum speed; II. vehicles with regard to the installation of a speed limitation device (SLD) of an approved type; III. speed limitation devices (SLD)], as amended, annexed to the Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions (1958 Agreement, as amended). As an alternative, the corresponding provisions of directives 92/6/EEC and 92/24/EEC, as amended, may apply provided that they have been amended in accordance with the latest amended form of ECE Regulation No 89 applicable at the time of the vehicle approval.'

Add a new Appendix B.4 as follows:

'APPENDIX B.4

PROVISIONS CONCERNING THE TRAINING FOR DRIVERS OF VEHICLES CARRYING DANGEROUS GOODS

240 000-
240 099

SECTION 1

GENERAL, STRUCTURE OF THE TRAINING AND TRAINING PROGRAMME

240 100 (1) Training shall be given in accordance with the provisions of this Appendix on the basis of marginals 10 315, 11 315 and 71 315.

(2) The necessary knowledge and skills shall be imparted by training covering theoretical courses and practical exercises. The knowledge shall be tested in an examination.

Structure

- 240 101** Initial and refresher training shall be given in the form of a basic course and, when applicable, specialization courses.
- 240 102** Subjects to be covered by the basic course will be, at least:
- (a) the general requirements governing the carriage of dangerous goods;
 - (b) the main types of hazard;
 - (c) information on environmental protection in the control of the transfer of wastes;
 - (d) preventive and safety measures appropriate to the various types of hazard;
 - (e) what to do after an accident (first aid, road safety, basic knowledge about the use of protective equipment, etc.);
 - (f) labelling and marking to indicate danger;
 - (g) what a driver should and should not do during the carriage of dangerous goods;
 - (h) the purpose and the method of operation of technical equipment on vehicles;
 - (i) prohibitions on mixed loading in the same vehicle or container;
 - (j) precautions to be taken during loading and unloading of dangerous goods;
 - (k) general information concerning civil liability;
 - (l) information on multimodal transport operation;
 - (m) handling and stowage of packages.
- 240 103** Special subjects to be covered by the specialization course for transport in tanks shall be, at least:
- (a) the behaviour of vehicles on the road, including movements of the load;
 - (b) specific requirements of the vehicles;
 - (c) general theoretical knowledge of the various and different loading and discharge systems;
 - (d) specific additional provisions applicable to the use of those vehicles (certificates of approval, approval marking, marking and labelling, etc.).
- 240 104** Special subjects to be covered by the specialization course for the transport of substances and articles of class 1 shall be, at least:
- (a) specific hazards related to explosive and pyrotechnic substances and articles;
 - (b) specific requirements concerning mixed loading of substances and articles of class 1.
- 240 105** Special subjects to be covered by the specialization course for the transport of radioactive material of class 7 shall be, at least:
- (a) specific hazards related to ionizing radiation;
 - (b) specific requirements concerning packing, handling, mixed loading and stowage of radioactive material;
 - (c) special measures to be taken in the event of an accident involving radioactive material.

Initial training programme

240 106 (1) The minimum duration of the theoretical element of each initial course or part of the comprehensive course shall be as follows:

Basic course	18 teaching units ⁽¹⁾
Specialization course for transport in tanks	12 teaching units ⁽¹⁾
Specialization course for transport of substances and articles of Class 1	8 teaching units
Specialization course for transport of radioactive material	8 teaching units

The total duration of the comprehensive course may be determined by the competent authority, who shall maintain the duration of the basic course and the specialized course for tanks, but may supplement it with shortened specialised courses for classes 1 and 7.

- (2) Teaching units are intended to last 45 minutes.
- (3) Normally, not more than 8 teaching units are permitted on each day of the course.
- (4) The individual practical exercises shall take place in connection with the theoretical training, and shall at least cover first aid, fire-fighting and what to do in case of an incident or accident.

Refresher training programme

240 107 (1) Refresher training courses undertaken at regular intervals serve the purpose of bringing the drivers' knowledge up to date; they shall cover new technical, legal and substance-related developments.

(2) Refresher courses shall have been completed before the period referred to in marginal 10 315 (3) has expired.

(3) The duration of each refresher course shall be of at least one day.

(4) Normally, not more than 8 teaching units shall be permitted on each day of the course.

**240 108-
240 199**

SECTION 2**APPROVAL OF TRAINING****Procedure**

240 200 The training courses shall be subject to approval by the competent authority.

240 201 (1) Approval shall only be given with regard to applications submitted in writing.

(2) The following documents shall be attached to the application for approval:

- (a) a detailed training programme specifying the subjects taught and indicating the time schedule and planned teaching methods;
- (b) qualifications and fields of activities of the teaching personnel;
- (c) information on the premises where the courses take place and on the teaching materials as well as on the facilities for the practical exercises;
- (d) conditions of participation in the courses, such as number of participants.

(3) The competent authority shall organize the supervision of training and examinations.

⁽¹⁾ Additional teaching units are required for practical exercises referred to in (4) below which will vary depending on the number of drivers under instruction.

Granting of approval

- 240 202 (1) Approval shall be granted in writing by the competent authority subject to the following conditions, in particular:
- (a) the training shall be given in conformity with the application documents;
 - (b) the competent authority shall be granted the right to send authorized persons to be present at the training courses and examinations;
 - (c) the competent authority shall be advised in time of the dates and the places of the individual training courses;
 - d) the approval may be withdrawn if the conditions of approval are not complied with.
- (2) The approval document shall indicate whether the courses concerned are basic or specialization courses, initial or refresher courses or comprehensive courses.
- 240 203 If the training body, after a training course has been given approval, intends to make any alterations with respect to such details as were relevant to the approval, it shall seek permission in advance from the competent authority. This applies in particular to changes concerning the training programme.

240 204-
240 299

SECTION 3**REQUIREMENTS APPLICABLE TO THE TRAINING**

- 240 300 The training provider shall ensure that the training instructors have a good knowledge of, and take into consideration, developments in regulations and training requirements relating to the transport of dangerous goods. The training shall be as practice-related as possible. The training programme shall conform with the approval, on the subjects set out in marginals 240 102 to 240 105. The initial training and refresher training shall also include individual practical exercises (see marginal 240 106).

240 301-
240 399

SECTION 4**EXAMINATIONS****Initial Basic course**

- 240 400 (1) After completion of the training, including the practical exercises, an examination shall be held on the basic course.
- (2) In the examination, the candidate has to prove that he has the knowledge, insight and skill for the practice of professional driver of vehicles carrying dangerous goods as provided in the basic training course.
- (3) For this purpose the competent authority, or the examination body approved by that authority, shall prepare a catalogue of questions which refer to the items summarized in marginal 240 102. Questions in the examination shall be drawn from this catalogue. The candidates shall not have any knowledge of the specific questions that are selected from the catalogue prior to the relevant examination.
- (4) A single examination for comprehensive courses may be held.
- (5) Each competent authority shall supervise the modalities of the examination.
- (6) The examination shall take the form of a written examination or a combination of a written and oral examination. Each candidate shall be asked at least 25 written questions. The duration of the examination shall be of at least 45 minutes. The questions may be of a varying degree of difficulty and be allocated a different weighting.

Initial specialization courses for transport in tanks and for the transport of explosive substances and articles and radioactive material

- 240 401** (1) After having sat the examination on the basic course and after having attended the specialization course for carriage in tanks and/or for the carriage of explosive or radioactive materials, the candidate shall be allowed to take part in the corresponding examination.
- (2) This examination shall be held and supervised on the same basis as in marginal 240 400 above.
- (3) At least 15 questions shall be asked with respect to each specialization course.

Refresher Courses

- 240 402** (1) After having undertaken a refresher training course the candidate shall be allowed to take part in the corresponding examination.
- (2) The examination shall be held and supervised on the same basis as set out in marginal 240 400 above.
- (3) At least 15 questions shall be asked with respect to the refresher training course.

**240 403-
240 499**

SECTION 5

CERTIFICATE OF DRIVER'S TRAINING

- 240 500** (1) According to paragraph (9) of marginal 10 315, the certificate shall be issued:
- (a) after completion of a basic training course, provided the candidate has successfully passed the examination in accordance with marginal 240 000 above;
- (b) if applicable, after completion of a specialization course for transport in tanks or transport of explosive substances or articles or of radioactive material, or after having acquired the knowledge according marginal 11 315 (3) or marginal 71 315 (3), provided the candidate has successfully passed an examination in accordance with marginal 240 401 above.
- (2) The certificate shall be renewed if the candidate furnishes proof of his participation in a refresher course in accordance with marginal 10 315 (3) and if he has successfully passed an examination in accordance with marginal 240 402 above.

**240 501-
249 999'**

APPENDIX B.5

- 250 000** (2) Amend descriptions for as follows:
- 20 asphyxiant gas or gas with no subsidiary risk
- 22 refrigerated liquefied gas, asphyxiant
- 223 refrigerated liquefied gas, flammable
- 225 refrigerated liquefied gas, oxidizing (fire-intensifying)
- 239 flammable gas, which can spontaneously lead to violent react
- 265 toxic gas, oxidizing (fire-intensifying)
- 40 'flammable solid, or self-reactive substance, or self-heating substance'
- 639 replace '(flash-point between 23° C and 61° C)' by '(flash-point not above 61° C)'

250 000
(cont'd)

Add new hazard identification numbers as follows:

- '263 toxic gas, flammable'
- '43 spontaneously flammable (pyrophoric) solid'
- 'X462 solid which reacts dangerously with water, emitting toxic gases**'
- 'X482 solid which, reacts dangerously with water, emitting corrosive gases**'
- '99 Miscellaneous dangerous substance carried at an elevated temperature.'

Delete hazard identification numbers 236, 266, 286, 836.

(3)

A. Amendments to Table 1 to 3, except for Class 2 entries

A.1 Amend entries in table 3 as follows:

Note: The amendments below are listed for table 3 only (numerical order). Corresponding consequential amendments have to be made to tables 1 and 2 as appropriate (alphabetical order).

Substance identification number	Name of substance	Hazard identification number	Label	Class, item number and letter
(a)	(b)	(c)	(d)	(e)
1199	Furaldehydes	63	6.1 + 3	6.1, 13° b)
1251	Methyl vinyl ketone, stabilized	639	6.1 + 3	6.1, 8° (a) 1.
1556	Arsenic compound, liquid, n.o.s., inorganic	66	6.1	6.1, 51° (a)
1556	Arsenic compound, liquid, n.o.s., inorganic	60	6.1	6.1, 51° (b), (c)
1557	Arsenic compound, solid, n.o.s., inorganic	66	6.1	6.1, 51° (a)
1557	Arsenic compound, solid, n.o.s., inorganic (arsenates, arsenites and arsenic sulphide)	60	6.1	6.1, 51° (b), (c)
1695	Chloroacetone, stabilized	663	6.1 + 3 + 8	6.1, 10° (a)
1809	Phosphorus trichloride	668	6.1 + 8	6.1, 67° (a)
2295	Methyl chloroacetate	663	6.1 + 3	6.1, 16° (a)
2310	Pentan-2,4-dione	36	3 + 6.1	3, 32°(c)
2477	Methyl isothiocyanate	663	6.1 + 3	6.1, 20° (a)
2487	Phenyl isocyanate	663	6.1 + 3	6.1, 18° (a)
2488	Cyclohexyl isocyanate	663	6.1 + 3	6.1, 18° (a)
2522	2-Dimethylaminoethyl methacrylate	69	6.1	6.1, 12° (b)
2542	Tributylamine	60	6.1	6.1, 12° (b)
2644	Methyl iodide	66	6.1	6.1, 15° (a)
2686	2-Diethylaminoethanol	83	8 + 3	8, 54°(b)
3023	2-Methyl-2-heptanethiol	663	6.1 + 3	6.1, 20° (a)
3073	Vinylpyridines, inhibited	639	6.1 + 3 + 8	6.1, 11° (b)1.
3302	2-Dimethylaminoethyl acrylate	60	6.1	6.1, 12° (b)

A.2 Amendments to Tables 1 and 3

A.2.1 Amend the hazard identification numbers of the following entries:

1730 Antimony pentachloride, liquid	X80
1754 Chlorosulphonic acid	X88
1758 Chromium oxychloride	X88

250 000 (cont'd)	1808 Phosphorus tribromide	X80
	1810 Phosphorus oxychloride	X80
	1817 Pyrosulphuryl chloride	X80
	1818 Silicon tetrachloride	X80
	1827 Stannic chloride, anhydrous (SnCl ₄)	X80
	1837 Thiophosphoryl chloride	X80
	1838 Titanium tetrachloride	X80
	2308 Nitrosylsulphuric acid	X80
	2444 Vanadium tetrachloride	X88
	2879 Selenium oxychloride	X886.

A.2.2 Add the letter (c) after 'Class 5.1, 11° (b)' in the entries for the following entries:

2427, 2428, 2429 and 3210.

A.2.3 Amend the column concerning the name for entry 3170 to read:

'Aluminium smelting by-products or aluminium remelting by-products.'

A.2.4 Add the letter (c) after 'Class 5.1, 13° (b)' in the entries for UN No 3211.

A.2.5 Identification number 1280: Delete the word 'inhibited'.

A.2.6 Identification number 2535: Amend the name to read '4-Methylmorpholine'

A.2.7 Identification number 1914: Amend the name to read 'Butyl propionates'

A.2.8 Identification number 2348: Amend the name to read 'Butyl acrylates, inhibited'

A.2.9 Identification number 1829: Amend the name to read 'Sulphur trioxide, inhibited or sulphur trioxide, stabilized'

A.2.10 Identification number 3253: In the name, delete the word 'pentahydrate'

A.2.11 Identification number 1791: Amend the name to read 'Hypochlorite solution' (twice) (delete references to available chlorine)

A.2.12 Identification number 1908: Amend the name to read 'Chlorite solution' (delete the reference to available chlorine)

A.2.13 Add '2.' after '6.1, 8°(a)' for the following identification numbers: 1092, 1098, 1143, 2606

A.2.14 Add '2.' after '6.1, 11°(b)' for identification number 2668

A.2.15 Insert the following new entries:

Substance identification number	Name of substance	Hazard identification number	Label	Class, item number and letter
(a)	(b)	(c)	(d)	(e)
1442	Ammonium perchlorate	50	5.1	5.1, 12°(b)
1841	Acetaldehyde ammonia	90	9	9, 31°(c)
1931	Zinc dithionite	90	9	9, 32°(c)
1941	Dibromodifluoromethane	90	9	9, 33°(c)
1990	Benzaldehyde	90	9	9, 34°(c)
2794	Batteries, wet, filled with acid, electric storage	80	8	8, 81°(c)
2795	Batteries, wet, filled with alkali, electric storage	80	8	8, 81°(c)

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(cont'd)

Substance identification number	Name of substance	Hazard identification number	Label	Class, item number and letter
(a)	(b)	(c)	(d)	(e)
2800	Batteries, wet, non-spillable, electric storage	80	8	8, 81°(c)
2969	Castor beans	90	9	9, 35°(c)
2969	Castor meal	90	9	9, 35°(c)
2969	Castor pomace	90	9	9, 35°(c)
2969	Castor flake	90	9	9, 35°(c)
3313	Organic pigments, self-heating	40	4.2	4.2, 5°(b) and (c)
3028	Batteries, dry containing potassium hydroxide solid, electric storage	80	8	8, 81°(c)
3314	Plastics moulding compound	90	9	9, 4°(c)
3320	Sodium borohydride and sodium hydroxide solution, with not more than 12 % sodium borohydride and not more than 40 % sodium hydroxide by mass	80	8	8, 42°(b) and (c)

A.2.16 Delete the following entries: 2369, 2467, 2489, 2658, 2708, 2711, 2906, 2938, 3241.

A.3 Amendments to Tables 2 and 3

A.3.1 Change the reference to the item number by a reference to item '41°' for the following identification numbers: 2758, 2762, 2764, 2766, 2768, 2770, 2772, 2774, 2776, 2778, 2780, 2782, 2787, 3021, 3024.

A.3.2 Change the reference to the item number by a reference to item 73° for the following entries: 2588, 2757, 2759, 2761, 2763, 2767, 2769, 2771, 2773, 2775, 2777, 2779, 2783, 2786, 3027.

A.3.3 Change the reference to the item number by a reference to item 72° for the following identification numbers: 2903, 2991, 2993, 2997, 2999, 3001, 3003, 3005, 3007, 3009, 3011, 3013, 3015, 3017, 3019, 3025.

A.3.4 Change the reference to the item number by a reference to item 71° for the following identification numbers: 2902, 2992, 2994, 2996, 2998, 3000, 3002, 3004, 3006, 3008, 3010, 3012, 3014, 3016, 3020, 3026.

A.3.6 For identification numbers 3210 and 3211, add 'or (c)' after '(b)'.

A.3.7 Add '2.' after '6.1, 11°(b)' for identification number 3275.

A.3.8 Insert the following new entries:

Substance identification number	Name of substance	Hazard identification number	Label	Class, item number and letter
(a)	(b)	(c)	(d)	(e)
2801	Dye or dye intermediate, liquid, corrosive, n.o.s.	88	8	8, 66°(a)
2929	Toxic liquid, flammable, organic, n.o.s.	663	6.1 + 3	6.1, 9°(a)
3257	Elevated temperature liquid, n.o.s.	99	9	9, 20°(c)
3258	Elevated temperature solid, n.o.s.	99	9	9, 21°(c)
3279	Organophosphorous compound, toxic, flammable, n.o.s.	663	6.1 + 3	6.1, 9°(a)

250 000 A.3.9 Delete the following entries: 1610, 3217.
(cont'd)

B. Consolidated amendments for Tables 1, 2 and 3 for Class 2 entries

B.1 Changes to Table 1 (alphabetical list)

Name of substance	Substance identification No (Lower part)	Hazard identification No (Upper part)	Label	Class and item number
(a)	(b)	(c)	(d)	(e)
Acetylene, dissolved	1001	239	3	2, 4 °F
Air, compressed	1002	20	2	2, 1°A
Air, refrigerated liquid	1003	225	2+05	2, 3°O
Ammonia, anhydrous	1005	268	6.1+8	2, 2°TC
Ammonia solution with more than 50 % ammonia	3318	268	6.1+8	2, 4°TC
Ammonia solution with more than 40 % and not more than 50 % ammonia	2073	20	2	2, 4°A
Ammonia solution with more than 35 % and not more than 40 % ammonia	2073	20	2	2, 4°A
Argon, compressed	1006	20	2	2, 1°A
Argon, refrigerated liquid	1951	22	2	2, 3°A
Boron trifluoride, compressed	1008	268	6.1+8	2, 1°TC
Bromine chloride	2901	265	6.1+05+8	2, 2°TOC
Bromotrifluoroethylene	2419	23	3	2, 2°F
Bromotrifluoromethane (R13B1)	1009	20	2	2, 2°A
1, 3-Butadiene, inhibited	1010	239	3	2, 2°F
1, 2-Butadiene, inhibited	1010	239	3	2, 2°F
Mixtures of 1, 3-butadiene and hydrocarbons, inhibited	1010	239	3	2, 2°F
Butane	1011	23	3	2, 2°F
Butane (trade name): see Mixture A, A0	1965	23	3	2, 2°F
1-Butylene	1012	23	3	2, 2°F
trans-2-Butylene	1012	23	3	2, 2°F
cis-2-Butylene	1012	23	3	2, 2°F
Butylenes mixture	1012	23	3	2, 2°F
Carbon dioxide	1013	20	2	2, 2°A
Carbon dioxide, refrigerated liquid	2187	22	2	2, 3°A
Carbon dioxide and nitrous oxide, mixture	1015	20	2	2, 2°A
Carbon monoxide, compressed	1016	263	6.1+3	2, 1°TF
Carbon monoxide and hydrogen mixture, compressed	2600	263	6.1+3	2, 1°TF
Carbonyl fluoride, compressed	2417	268	6.1+8	2, 1°TC
Carbonyl sulphide	2204	263	6.1+3	2, 2°TF
Chlorine	1017	268	6.1+8	2, 2°TC
Chlorine trifluoride	1749	265	6.1+05+8	2, 2°TOC

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(cont'd)

Name of substance	Substance identification No (Lower part)	Hazard identification No (Upper part)	Label	Class and item number
(a)	(b)	(c)	(d)	(e)
Chlorodifluorobromomethane (R 12B1)	1974	20	2	2, 2°A
1-Chloro-1, 1-difluoroethane (R 142b)	2517	23	3	2, 2°F
Chlorodifluoromethane (R 22)	1018	20	2	2, 2°A
Chlorodifluoromethane and chloropentafluoroethane mixture (R 502)	1973	20	2	2, 2°A
Chloropentafluoroethane (R 115)	1020	20	2	2, 2°A
1-Chloro-1, 2, 2, 2-tetrafluoroethane (R 124)	1021	20	2	2, 2°A
1-Chloro-2, 2, 2-trifluoroethane (R 133a)	1983	20	2	2, 2°A
Chlorotrifluoromethane (R 13)	1022	20	2	2, 2°A
Chlorotrifluoromethane and trifluoromethane, azeotropic mixture (R 503)	2599	20	2	2, 2°A
Coal gas, compressed	1023	263	6.1+3	2, 1°TF
Cyanogen	1026	263	6.1+3	2, 2°TF
Cyclobutane	2601	23	3	2, 2°F
Cyclopropane	1027	23	3	2, 2°F
Deuterium, compressed	1957	23	3	2, 1°F
Dichlorodifluoromethane (R 12)	1028	20	2	2, 2°A
Dichlorodifluoromethane and 1, 1-difluoroethane, azeotropic mixture (R 500)	2602	20	2	2, 2°A
Dichlorodifluoromethane and ethylene oxide mixture	3070	20	2	2, 2°A
Dichlorofluoromethane (R 21)	1029	20	2	2, 2°A
Dichlorosilane	2189	263	6.1+05+8	2, 2°TFC
1, 2-Dichloro-1, 1, 2, 2-tetrafluoroethane (R 114)	1958	20	2	2, 2°A
1, 1-Difluoroethane (R 152a)	1030	23	3	2, 2°F
1, 1-Difluoroethylene (R 1132a)	1959	239	3	2, 2°F
Difluoromethane	3252	23	3	2, 2°F
Dimethylamine, anhydrous	1032	23	3	2, 2°F
Dimethyl ether	1033	23	3	2, 2°F
2, 2-Dimethylpropane	2044	23	3	2, 2°F
Dinitrogen tetroxide (nitrogen dioxide)	1067	265	6.1+05+8	2, 2°TOC
Ethane	1035	23	3	2, 2°F
Ethane, refrigerated liquid	1961	223	3	2, 3°F
Ethylacetylene, inhibited	2452	239	3	2, 2°F
Ethylamine	1036	23	3	2, 2°F

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(cont'd)

Name of substance	Substance identification No (Lower part)	Hazard identification No (Upper part)	Label	Class and item number
(a)	(b)	(c)	(d)	(e)
Ethyl chloride	1037	23	3	2, 2°F
Ethylene, compressed	1962	23	3	2, 1°F
Ethylene, refrigerated liquid	1038	223	3	2, 3°F
Ethylene, acetylene and propylene mixture, refrigerated liquid	3138	223	3	2, 3°F
Ethylene oxide and carbon dioxide mixture, with more than 9 % but not more than 87 % ethylene oxide	1041	239	3	2, 2°F
Ethylene oxide and carbon dioxide mixture with more than 87 % ethylene oxide	3300	263	6.1+3	2, 2°TF
Ethylene oxide and carbon dioxide mixture, with not more than 9 % ethylene oxide	1952	20	2	2, 2°A
Ethylene oxide and chlorotetrafluoroethane mix- ture	3297	20	2	2, 2°A
Ethylene oxide and pentafluoroethane mixture	3298	20	2	2, 2°A
Ethylene oxide and tetrafluoroethane mixture	3299	20	2	2, 2°A
Ethylene oxide with nitrogen	1040	263	6.1+3	2, 2°TF
Ethyl fluoride (R161)	2453	23	3	2, 2°F
Ethyl methyl ether	1039	23	3	2, 2°F
Helium, compressed	1046	20	2	2, 1°A
Helium, refrigerated liquid	1963	22	2	2, 3°A
Heptafluoropropane (R 227)	3296	20	2	2, 2°A
Hexaethyl tetraphosphate and compressed gas mixture	1612	26	6.1	2, 1°T
Hexafluoroacetone	2420	268	6.1+8	2, 2°TC
Hexafluoroethane (R 116), compressed	2193	20	2	2, 1°A
Hexafluoropropylene (R 1216)	1858	20	2	2, 2°A
Hydrogen, compressed	1049	23	3	2, 1°F
Hydrogen, refrigerated liquid	1966	223	3	2, 3°F
Hydrogen and methane mixture, compressed	2034	23	3	2, 1°F
Hydrogen bromide, anhydrous	1048	268	6.1+8	2, 2°TC
Hydrogen chloride, anhydrous	1050	268	6.1+8	2, 2°TC
Hydrogen iodide, anhydrous	2197	268	6.1+8	2, 2°TC
Hydrogen sulphide	1053	263	6.1+3	2, 2°TF
Isobutane	1969	23	3	2, 2°F
Isobutylene	1055	23	3	2, 2°F
Krypton, compressed	1056	20	2	2, 1°A
Krypton, refrigerated liquid	1970	22	2	2, 3°A

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(cont'd)

Name of substance	Substance identification No (Lower part)	Hazard identification No (Upper part)	Label	Class and item number
(a)	(b)	(c)	(d)	(e)
Liquefied gases, non-flammable, charged with nitrogen, carbon dioxide or air	1058	20	2	2, 2°A
Methane, compressed	1971	23	3	2, 1°F
Methane, refrigerated liquid	1972	223	3	2, 3°F
Methylacetylene and propadiene mixtures, stabilized	1060	239	3	2, 2°F
Methyl bromide	1062	26	6.1	2, 2°T
Methyl chloride	1063	23	3	2, 2°F
Methyl chloride and methylene chloride mixture	1912	23	3	2, 2°F
Methyl fluoride (R41)	2454	23	3	2, 2°F
Methylamine, anhydrous	1061	23	3	2, 2°F
Methyl mercaptan	1064	263	6.1+3	2, 2°TF
Mixture A, A0, A1, B, C: see Hydrocarbon gas mixture liquefied, n.o.s.	1965	23	3	2, 2°F
Mixture F1, F2, F3: see Refrigerant gas, n.o.s.	1078	20	2	2, 2°A
Mixture P1, P2: see methylacetylene and propadiene, mixtures, stabilized	1060	239	3	2, 2°F
Natural gas, compressed	1971	23	3	2, 1°F
Natural gas, refrigerated liquid	1972	223	3	2, 3°F
Neon, compressed	1065	20	2	2, 1°A
Neon, refrigerated liquid	1913	22	2	2, 3°A
Nitrogen, compressed	1066	20	2	2, 1°A
Nitrogen, refrigerated liquid	1977	22	2	2, 3°A
Nitrogen trifluoride, compressed	2451	265	6.1+05	2, 1°TO
Nitrous oxide	1070	25	2+05	2, 2°O
Nitrous oxide, refrigerated liquid	2201	225	2+05	2, 3°O
Octafluorobut-2-ene (R 1318)	2422	20	2	2, 2°A
Octafluorocyclobutane (RC 318)	1976	20	2	2, 2°A
Octafluoropropane (R 218)	2424	20	2	2, 2°A
Oil gas, compressed	1071	263	6.1+3	2, 1°TF
Oxygen, compressed	1072	25	2+05	2, 1°O
Oxygen, refrigerated liquid	1073	225	2+05	2, 3°O
Oxygen and carbon dioxide mixture, compressed (max. 30 % CO ₂)	1014	25	2+05	2, 1°O
Pentafluoroethane (R 125)	3220	20	2	2, 2°A
Perchloryl fluoride	3083	265	6.1+05	2, 2°TO

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(cont'd)

Name of substance	Substance identification No (Lower part)	Hazard identification No (Upper part)	Label	Class and item number
(a)	(b)	(c)	(d)	(e)
Perfluoroethylvinyl ether	3154	23	3	2, 2°F
Perfluoromethylvinyl ether	3153	23	3	2, 2°F
Petroleum gases, liquefied	1075	23	3	2, 2°F
Phosgene	1076	268	6.1+8	2, 2°TC
Propane	1978	23	3	2, 2°F
Propane (trade name): see Mixture C	1965	23	3	2, 2°F
Propadiene, inhibited	2200	239	3	2, 2°F
Propylene	1077	23	3	2, 2°F
Rare gases and nitrogen mixture, compressed	1981	20	2	2, 1°A
Rare gases and oxygen mixture, compressed	1980	20	2	2, 1°A
Rare gases mixture, compressed	1979	20	2	2, 1°A
Silane, compressed	2203	23	3	2, 1°F
Silicon tetrafluoride, compressed	1859	268	6.1+8	2, 1°TC
Sulphur dioxide	1079	268	6.1+8	2, 2°TC
Sulphur hexafluoride	1080	20	2	2, 2°A
Sulphuryl fluoride	2191	26	6.1	2, 2°T
Tetrafluoroethylene, inhibited	1081	239	3	2, 2°F
1, 1, 1, 2-Tetrafluoroethane (R 134a)	3159	20	2	2, 2°A
Tetrafluoromethane (R 14), compressed	1982	20	2	2, 1°A
Trifluoroacetyl chloride	3057	268	6.1+8	2, 2°TC
Trifluorochloroethylene, inhibited (R 1113)	1082	263	6.1+3	2, 2°TF
1, 1, 1-Trifluoroethane (R 143a)	2035	23	3	2, 2°F
Trifluoromethane (R 23)	1984	20	2	2, 2°A
Trifluoromethane, refrigerated liquid	3136	22	2	2, 3°A
Trimethylamine, anhydrous	1083	23	3	2, 2°F
Vinyl bromide, inhibited	1085	239	3	2, 2°F
Vinyl chloride, inhibited or stabilized	1086	239	3	2, 2°F
Vinyl fluoride, inhibited	1860	239	3	2, 2°F
Vinyl methyl ether, inhibited	1087	239	3	2, 2°F
Xenon, compressed	2036	20	2	2, 1°A
Xenon, refrigerated liquid	2591	22	2	2, 3°A

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(cont'd)**B.2 Changes to Table 2 (collective headings/n.o.s. entries):**

Name of substance	Substance Identification No (Lower part)	Hazard Identification No (Upper part)	Label	Class and item number
(a)	(b)	(c)	(d)	(e)
Class 2: Gases				
Specific n.o.s. entries				
Hydrocarbon gas mixture, compressed, n.o.s.	1964	23	3	2, 1°F
Insecticide gas, toxic, n.o.s.	1967	26	6.1	2, 2°T
Insecticide gas, n.o.s.	1968	20	2	2, 2°A
Refrigerant gas, n.o.s.	1078	20	2	2, 2°A
Hydrocarbon gas mixture, liquefied, n.o.s.	1965	23	3	2, 2°F
General n.o.s. entries				
Compressed gas, n.o.s.	1956	20	2	2, 1°A
Compressed gas, oxidizing, n.o.s.	3156	25	2+05	2, 1°O
Compressed gas, flammable, n.o.s.	1954	23	3	2, 1°F
Compressed gas, toxic, n.o.s.	1955	26	6.1	2, 1°T
Compressed gas, toxic, flammable, n.o.s.	1953	263	6.1+3	2, 1°TF
Compressed gas, toxic, corrosive, n.o.s.	3304	268	6.1+8	2, 1°TC
Compressed gas, toxic, oxidizing, n.o.s.	3303	265	6.1+05	2, 1°TO
Compressed gas, toxic, flammable, corrosive, n.o.s.	3305	263	6.1+3+8	2, 1°TFC
Compressed gas, toxic, oxidizing, corrosive, n.o.s.	3306	265	6.1+05+8	2, 1°TOC
Liquefied gas, n.o.s.	3163	20	2	2, 2°A
Liquefied gas, oxidizing, n.o.s.	3157	25	2+05	2, 2°O
Liquefied gas, flammable, n.o.s.	3161	23	3	2, 2°F
Liquefied gas, toxic, n.o.s.	3162	26	6.1	2, 2°T
Liquefied gas, toxic, flammable, n.o.s.	3160	263	6.1+3	2, 2°TF
Liquefied gas, toxic, corrosive, n.o.s.	3308	268	6.1+8	2, 2°TC
Liquefied gas, toxic, flammable, corrosive, n.o.s.	3309	263	6.1+3+8	2, 2°TFC
Liquefied gas, toxic, oxidizing, n.o.s.	3307	265	6.1+05	2, 2°TO
Liquefied gas, toxic, oxidizing, corrosive, n.o.s.	3310	265	6.1+05+8	2, 2°TOC
Gas, refrigerated liquid, n.o.s.	3158	22	2	2, 3°A
Gas, refrigerated liquid, oxidizing, n.o.s.	3311	225	2+05	2, 3°O
Gas, refrigerated liquid, flammable, n.o.s.	3312	223	3	2, 3°F

250 000 B.3 Changes to Table 3 (numerical list):

(cont'd)

Substance identification No (Lower part)	Name of substance	Hazard identification No (Upper part)	Label	Class and item number
(a)	(b)	(c)	(d)	(e)
1001	Acetylene, dissolved	239	3	2, 4°F
1002	Air, compressed	20	2	2, 1°A
1003	Air, refrigerated liquid	225	2+05	2, 3°O
1005	Ammonia, anhydrous	268	6.1+8	2, 2°TC
1006	Argon, compressed	20	2	2, 1°A
1008	Boron trifluoride, compressed	268	6.1+8	2, 1°TC
1009	Bromotrifluoromethane (R 13B1)	20	2	2, 2°A
1010	1, 3-Butadiene, inhibited	239	3	2, 2°F
1010	Mixtures of 1, 3-butadiene and hydrocarbons, inhibited	239	3	2, 2°F
1010	1, 2-Butadiene, inhibited	239	3	2, 2°F
1011	Butane	23	3	2, 2°F
1012	1-Butylene	23	3	2, 2°F
1012	Butylenes mixture	23	3	2, 2°F
1012	cis-2-Butylene	23	3	2, 2°F
1012	trans-2-Butylene	23	3	2, 2°F
1013	Carbon dioxide	20	2	2, 2°A
1014	Oxygen and carbon dioxide mixture, compressed (max. 30 % CO ₂)	25	2+05	2, 1°O
1015	Carbon dioxide and nitrous oxide, mixture	20	2	2, 2°A
1016	Carbon monoxide, compressed	263	6.1+3	2, 1°TF
1017	Chlorine	268	6.1+8	2, 2°TC
1018	Chlorodifluoromethane (R 22)	20	2	2, 2°A
1020	Chloropentafluoroethane (R 115)	20	2	2, 2°A
1021	1-Chloro-1, 2, 2, 2-tetrafluoroethane (R 124)	20	2	2, 2°A
1022	Chlorotrifluoromethane (R 13)	20	2	2, 2°A
1023	Coal gas, compressed	263	6.1+3	2, 1°TF
1026	Cyanogen	263	6.1+3	2, 2TF
1027	Cyclopropane	23	3	2, 2°F
1028	Dichlorodifluoromethane (R 12)	20	2	2, 2°A
1029	Dichlorofluoromethane (R 21)	20	2	2, 2°A
1030	1, 1-Difluoroethane (R 152a)	23	3	2, 2°F
1032	Dimethylamine, anhydrous	23	3	2, 2°F
1033	Dimethyl ether	23	3	2, 2°F
1035	Ethane	23	3	2, 2°F
1036	Ethylamine	23	3	2, 2°F
1037	Ethyl chloride	23	3	2, 2°F
1038	Ethylene, refrigerated liquid	223	3	2, 3°F

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(cont'd)

Substance identification No (Lower part)	Name of substance	Hazard identification No (Upper part)	Label	Class and item number
(a)	(b)	(c)	(d)	(e)
1039	Ethyl methyl ether	23	3	2, 2°F
1040	Ethylene oxide with nitrogen	263	6.1+3	2, 2°TF
1041	Ethylene oxide and carbon dioxide mixture, with more than 9 % but not more than 87 % ethylene oxide	239	3	2, 2°F
1046	Helium, compressed	20	2	2, 1°A
1048	Hydrogen bromide, anhydrous	268	6.1+8	2, 2°TC
1049	Hydrogen, compressed	23	3	2, 1°F
1050	Hydrogen chloride, anhydrous	268	6.1+8	2, 2°TC
1053	Hydrogen sulphide	263	6.1+3	2, 2°TF
1055	Isobutylene	23	3	2, 2°F
1056	Krypton, compressed	20	2	2, 1°A
1058	Liquefied gases, non-flammable, charged with nitro- gen, carbon dioxide or air	20	2	2, 2°A
1060	Methylacetylene and propadiene mixtures, stabilized	239	3	2, 2°F
1060	Mixture P1, P2: see methylacetylene and propadiene, mixtures, stabilized	239	3	2, 2°F
1061	Methylamine, anhydrous	23	3	2, 2°F
1062	Methyl bromide	26	6.1	2, 2°T
1063	Methyl chloride	23	3	2, 2°F
1064	Methyl mercaptan	263	6.1+3	2, 2°TF
1065	Neon, compressed	20	2	2, 1°A
1066	Nitrogen, compressed	20	2	2, 1°A
1067	Dinitrogen tetroxide (nitrogen dioxide)	265	6.1+05+8	2, 2°TOC
1070	Nitrous oxide	25	2+05	2, 2°O
1071	Oil gas, compressed	263	6.1+3	2, 1°TF
1072	Oxygen, compressed	25	2+05	2, 1°O
1073	Oxygen, refrigerated liquid	225	2+05	2, 3°O
1075	Petroleum gases, liquefied	23	3	2, 2°F
1076	Phosgene	268	6.1+8	2, 2°TC
1077	Propylene	23	3	2, 2°F
1078	Mixture F1, F2, F3: see Refrigerant gas, n.o.s.	20	2	2, 2°A
1079	Sulphur dioxide	268	6.1+8	2, 2°TC
1080	Sulphur hexafluoride	20	2	2, 2°A
1081	Tetrafluoroethylene, inhibited	239	3	2, 2°F
1082	Trifluorochloroethylene, inhibited (R 1113)	263	6.1+3	2, 2°TF
1083	Trimethylamine, anhydrous	23	3	2, 2°F
1085	Vinyl bromide, inhibited	239	3	2, 2°F

250 000
(cont'd)

Substance identification No (Lower part)	Name of substance	Hazard identification No (Upper part)	Label	Class and item number
(a)	(b)	(c)	(d)	(e)
1086	Vinyl chloride, inhibited or stabilized	239	3	2, 2°F
1087	Vinyl methyl ether, inhibited	239	3	2, 2°F
1612	Hexaethyl tetraphosphate and compressed gas mixture	26	6.1	2, 1°T
1749	Chlorine trifluoride	265	6.1+05+8	2, 2°TOC
1858	Hexafluoropropylene (R 1216)	20	2	2, 2°A
1859	Silicon tetrafluoride, compressed	268	6.1+8	2, 1°TC
1860	Vinyl fluoride, inhibited	239	3	2, 2°F
1912	Methyl chloride and methylene chloride mixture	23	3	2, 2°F
1913	Neon, refrigerated liquid	22	2	2, 3°A
1951	Argon, refrigerated liquid	22	2	2, 3°A
1952	Ethylene oxide and carbon dioxide mixture, with not more than 9 % ethylene oxide	20	2	2, 2°A
1957	Deuterium, compressed	23	3	2, 1°F
1958	1, 2-Dichloro-1, 1, 2, 2-tetrafluoroethane (R 114)	20	2	2, 2°A
1959	1, 1-Difluoroethylene (R 1132a)	239	3	2, 2°F
1961	Ethane, refrigerated liquid	223	3	2, 3°F
1962	Ethylene, compressed	23	3	2, 1°F
1963	Helium, refrigerated liquid	22	2	2, 3°A
1965	Mixture A, A0, A1, B, C: see Hydrocarbon gas mixture liquefied, n.o.s.	23	3	2, 2°F
1965	Propane (trade name): see Mixture C	23	3	2, 2°F
1965	Butane (trade name): see Mixture A, A0	23	3	2, 2°F
1966	Hydrogen, refrigerated liquid	223	3	2, 3°F
1969	Isobutane	23	3	2, 2°F
1970	Krypton, refrigerated liquid	22	2	2, 3°A
1971	Methane, compressed	23	3	2, 1°F
1971	Natural gas, compressed	23	3	2, 1°F
1972	Methane, refrigerated liquid	223	3	2, 3°F
1972	Naturalgas, refrigerated liquid	223	3	2, 3°F
1973	Chlorodifluoromethane and chloropentafluoroethane mixture (R 502)	20	2	2, 2°A
1974	Chlorodifluorobromomethane (R 12B1)	20	2	2, 2°A
1976	Octafluorocyclobutane (RC 318)	20	2	2, 2°A
1977	Nitrogen, refrigerated liquid	22	2	2, 3°A
1978	Propane	23	3	2, 2°F
1979	Rare gases mixture, compressed	20	2	2, 1°A
1980	Rare gases and oxygen mixture, compressed	20	2	2, 1°A
1981	Rare gases and nitrogen mixture, compressed	20	2	2, 1°A
1982	Tetrafluoromethane (R 14), compressed	20	2	2, 1°A

250 000
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Substance identification No (Lower part)	Name of substance	Hazard identification No (Upper part)	Label	Class and item number
(a)	(b)	(c)	(d)	(e)
1983	1-Chloro-2, 2, 2-trifluoroethane (R 133a)	20	2	2, 2 ^o A
1984	Trifluoromethane (R 23)	20	2	2, 2 ^o A
2034	Hydrogen and methane mixture, compressed	23	3	2, 1 ^o F
2035	1, 1, 1-Trifluoroethane (R 143a)	23	3	2, 2 ^o F
2036	Xenon, compressed	20	2	2, 1 ^o A
2044	2, 2-Dimethylpropane	23	3	2, 2 ^o F
2073	Ammonia solution with more than 40 % and not more than 50 % ammonia	20	2	2, 4 ^o A
2073	Ammonia solution with more than 35 % and not more than 40 % ammonia	20	2	2, 4 ^o A
2187	Carbon dioxide, refrigerated liquid	22	2	2, 3 ^o A
2189	Dichlorosilane	263	6.1+05+8	2, 2 ^o TFC
2191	Sulphuryl fluoride	26	6.1	2, 2 ^o T
2193	Hexafluoroethane (R 116), compressed	20	2	2, 1 ^o A
2197	Hydrogen iodide, anhydrous	268	6.1+8	2, 2 ^o TC
2200	Propadiene, inhibited	239	3	2, 2 ^o F
2201	Nitrous oxide, refrigerated liquid	225	2+05	2, 3 ^o O
2203	Silane, compressed	23	3	2, 1 ^o F
2204	Carbonyl sulphide	263	6.1+3	2, 2 ^o TF
2417	Carbonyl fluoride, compressed	268	6.1+8	2, 1 ^o TC
2419	Bromotrifluoroethylene	23	3	2, 2 ^o F
2420	Hexafluoroacetone	268	6.1+8	2, 2 ^o TC
2422	Octafluorobut-2-ene (R 1318)	20	2	2, 2 ^o A
2424	Octafluoropropane (R 218)	20	2	2, 2 ^o A
2451	Nitrogen trifluoride, compressed	265	6.1+05	2, 1 ^o TO
2452	Ethylacetylene, inhibited	239	3	2, 2 ^o F
2453	Ethyl fluoride (R161)	23	3	2, 2 ^o F
2454	Methyl fluoride (R41)	23	3	2, 2 ^o F
2517	1-Chloro-1, 1-difluoroethane (R 142b)	23	3	2, 2 ^o F
2591	Xenon, refrigerated liquid	22	2	2, 3 ^o A
2599	Chlorotrifluoromethane and trifluoromethane, azeotropic mixture (R 503)	20	2	2, 2 ^o A
2600	Carbon monoxide and hydrogen mixture, compressed	263	6.1+3	2, 1 ^o TF
2601	Cyclobutane	23	3	2, 2 ^o F
2602	Dichlorodifluoromethane and 1, 1-difluoroethane, azeotropic mixture (R 500)	20	2	2, 2 ^o A
2901	Bromine chloride	265	6.1+05+8	2, 2 ^o TOC

250 000
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Substance identification No (Lower part)	Name of substance	Hazard identification No (Upper part)	Label	Class and item number
(a)	(b)	(c)	(d)	(e)
3057	Trifluoroacetyl chloride	268	6.1+8	2, 2°TC
3070	Dichlorodifluoromethane and ethylene oxide mixture	20	2	2, 2°A
3083	Perchloryl fluoride	265	6.1+05	2, 2°TO
3136	Trifluoromethane, refrigerated liquid	22	2	2, 3°A
3138	Ethylene, acetylene and propylene mixture, refrigerated liquid	223	3	2, 3°F
3153	Perfluoromethylvinyl ether	23	3	2, 2°F
3154	Perfluoroethylvinyl ether	23	3	2, 2°F
3159	1, 1, 1, 2-Tetrafluoroethane (R 134a)	20	2	2, 2°A
3220	Pentafluoroethane (R 125)	20	2	2, 2°A
3252	Difluoromethane	23	3	2, 2°F
3296	Heptafluoropropane (R 227)	20	2	2, 2°A
3297	Ethylene oxide and chlorotetrafluoroethane mixture	20	2	2, 2°A
3298	Ethylene oxide and pentafluoroethane mixture	20	2	2, 2°A
3299	Ethylene oxide and tetrafluoroethane mixture	20	2	2, 2°A
3300	Ethylene oxide and carbon dioxide mixture with more than 87 % ethylene oxide	263	6.1+3	2, 2°TF
3318	Ammonia solution with more than 50 % ammonia	268	6.1+8	2, 4°TC

Add a new Appendix B.7 as follows:

‘APPENDIX B.7

MARK FOR ELEVATED TEMPERATURE SUBSTANCES’

270 000

The mark for elevated temperature substances required in marginals 91 500(3), 211 960 and 212 960 is a triangular shaped mark with sides of at least 250 mm, to be shown in red, as reproduced below.

270 000
(cont'd)



(The black parts are to be printed in red)