ANNEX A — ANNEXE A

No. 8940. EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR). DONE AT GENEVA, ON 30 SEPTEMBER 1957[1]

ENTRY INTO FORCE of amendments to annexes A[2] and B[3], as amended, of the above-mentioned Agreement

The amendments were proposed by the Government of France and circulated by the Secretary-General on 30 June 1992. They came into force on 1 January 1993, in accordance with article 14 (3) of the Agreement.

AMENDMENTS TO THE ADR ADOPTED BY THE GROUP OF EXPERTS

Annex A

GENERAL PROVISIONS

2000 Insert following new (4) - existing (4) becomes (5):

(4) For the purposes of ADR, "n.o.s. (not otherwise specified) entry" means a collective entry to which substances, mixtures, solutions or articles may be assigned if they:

(a) are not mentioned by name in the items of the lists of substances, and

(b) exhibit chemical, physical and/or dangerous properties corresponding to the class, item, letter and name of the n.o.s. entry.

[1] United Nations, *Treaty Series*, vol. 619, p. 77; for subsequent actions, see references in Cumulative Indexes Nos. 9, and 11 to 18, as well as annex A in volumes 1107, 1129, 1141, 1161, 1162, 1237, 1259, 1279, 1283, 1297, 1344, 1394, 1395, 1430, 1489, 1505, 1553, 1580, 1663, 1679 and 1696.

[2] For the texts of annex A, as modified, see vol. 641, p. 3 (authentic French text of annex A to the Agreement, as modified), and vol. 731, p. 3 (English translation of annex A to the Agreement, as modified); for subsequent actions, see references in Cumulative Indexes Nos. 12 to 18, as well as annex A in volumes 1107, 1162, 1259, 1283, 1297, 1395, 1489 and 1553.

[3] For the texts of annex B, as modified, see vol. 641, p. 415 (authentic French text of annex B to the Agreement, as modified), and vol. 731, p. 363 (English translation of annex B to the Agreement, as modified); for subsequent actions, see references in Cumulative Indexes Nos. 12 to 18, as well as annex A in volumes 1107, 1161, 1162, 1259, 1279, 1283, 1297, 1344, 1395, 1489, 1553 and 1663.

2002 (1) In the third sentence, delete:

"4.2, 4.3, 5.2" and "2431, 2471, 2551,"

In the fourth sentence, insert:

"4.2, 4.3, 5.2" and "2431, 2471, 2551,"

(2) Against "Class 4.2", "Class 4.3" and "Class 5.2" amend "Rectrictive" to "Non-restrictive".

Delete current marginal 2002(3). Insert the following.

"(3) Any carriage of goods governed by this annex shall be accompanied by both the following documents:

(a) a transport document containing at least the following information (for Class 7, see also marginal 2709):

a description of the goods including the substance identification number (where available) 1/

the class 1/

the item number together with any letter 1/

the initials ADR or RID 1/

the number and a description of the packages or IBCs

the gross mass (also net for explosives) in grams or kilograms

the name and address of the consignor

the name and address of the consignee(s)

a declaration as required by the terms of any special agreement.

The document containing this information may be that already required by other regulations in force for carriage by another mode of transport. The consignor shall communicate this information to the carrier in writing.

1/ These and other details can be found in section 2.B. "Particulars in the transport document" of each Class or in the Schedules of Class 7.

2002 (cont'd) The particulars to be entered in the document shall be drafted in an official language of the forwarding country, and also, if that language is not English, French or German, in English, French or German, unless international road transport tariffs, if any, or agreements concluded between the countries concerned in the transport operation, provide otherwise.

(b) instructions to be implemented in the event of an accident (see Annex B, marginal 10 385), (unless exempted under marginal 10 011).

(8) Beginning, read:

"The following provisions shall apply to substances, solutions and mixtures (such as ....".

Delete NOTE 3 and renumber NOTE 4.

(b) Beginning, read:

"Substances having more than one danger characteristic and solutions and mixtures containing ....".

Texts after (b), read:

"1.1. The physical and chemical characteristics and physiological properties shall be determined by measurement or calculation and be classified according to the criteria of the various classes.

1.2. Text of 2, with the second sentence deleted and "such solutions or mixtures" replaced by "the solutions or mixtures.

2. If a substance presents more than one danger characteristic or if a mixture or solution contains more than one component of the classes or groups of substances listed below, it shall be classified in the class or the group of substances presenting the predominant danger.

2.1 If there is no predominant danger, classification shall be based on the following order of precedence:

- substances and articles of Class 1
- self-reactive substances and wetted explosives of Class 4.1
- pyrophoric substances of Class 4.2
- substances of Class 5.2
- substances and articles of Class 2
- substances of Class 6.1 or 3 which, on the basis of their toxicity on inhalation, are to be classified under (a) of the various items
- substances of Class 6.2.

2002 (8) (cont'd) 2.2. If the danger characteristics fall within more than one class or group of substances not listed in 2.1, the substances, mixtures or solutions shall be classified in the class or group of substances presenting the predominant danger.

2.3. If there is no predominant danger, the substance, solution or mixture shall be classified as follows:

2.3.1. Assignment to a class shall be on the basis of the various danger characteristics or components in accordance with the table below. For Classes 3, 4.1, 4.2, 4.3, 5.1, 6.1, 8 and 9, account shall be taken of the degree of danger indicated by letters (a), (b) or (c) of the various items [see marginals 2300 (3), 2400 (3), 2430 (3), 2470 (3), 2500 (3), 2600 (1), 2800 (1) and 2900]."

Replace the table in 2.3.1 by the following table (see next page).

Footnote 5, read:

"5/ Assignment to a class and a letter of an item may be based on the test procedure (see Appendix A.3)."

In footnote 6/ to the Table pertaining to 2.3.1, replace "polychlorinated biphenyls (PCB)" by "substances".

In the Note to 2.3.2 the third example should begin as follows:

"A solution of naphthalene (crude or refined) of Class 4.1, 6°(c) ..."

(9) The beginning should be read as follows:

"The sender, either in the transport document or in a separate declaration, incorporated into or combined with it, ...".

In the last sentence replace "sender" by "consignor".

2003 (1) (b) A.1 and 2 read:

"1. General conditions of packing;
2. Special conditions of packing;"

2003 (4) Amend descriptions of Appendices A.3 and A.6 as follows:

"Appendix A.3: Tests relating to flammable liquids of Classes 3, 6.1 and 8; test for determining fluidity; tests relating to flammable solids of Class 4.1; tests relating to substances liable to spontaneous combustion of Class 4.2; test relating to substances of Class 4.3 which in contact with water emit flammable gases; test relating to oxidizing solids of Class 5.1;"

Table

Class and, where applicable, letter	4.1 (b)	4.1 (c)	4.2 (b)	4.2 (c)	4.3(a)	4.3(b)	4.3(c)	5.1(a)[1]	5.1(b)[1]	5.1(c)[1]	6.1(a)[3] DERMAL	6.1(a)[3] ORAL	6.1(b)[3]	6.1(c)[3]	8(a)[4]	8(b)[4]	8(c)[4]	9
3(a)[2]	SOL LIQ 4.1[5]3(a)	SOL LIQ 4.1[5]3(a)	SOL LIQ 4.2[5]3(a)	SOL LIQ 4.2[5]3(a)	4.3(a)	4.3(a)	4.3(a)	SOL LIQ 5.1(a)3(a)	SOL LIQ 5.1(a)3(a)	SOL LIQ 5.1(a)3(a)	3(a)	3(a)	3(a)	3(a)	3(a)	3(a)	3(a)	3(a)
3(b)[2]	SOL LIQ 4.1[5]3(b)	SOL LIQ 4.1[5]3(b)	SOL LIQ 4.2[5]3(b)	SOL LIQ 4.2[5]3(b)	4.3(a)	4.3(b)	4.3(b)	SOL LIQ 5.1(a)3(a)	SOL LIQ 5.1(b)3(b)	SOL LIQ 5.1(b)3(b)	3(a)	3(a)	3(b)	3(b)	3(a)	3(b)	3(b)	3(b)
3(c)[2]	SOL LIQ 4.1[5]3(b)	SOL LIQ 4.1[5]3(c)	SOL LIQ 4.2[5]3(b)	SOL LIQ 4.2[5]3(c)	4.3(a)	4.3(b)	4.3(c)	SOL LIQ 5.1(a)3(a)	SOL LIQ 5.1(b)3(b)	SOL LIQ 5.1(c)3(c)	6.1(a)	6.1(a)	6.1(b)	6.1(c)	8(a)	8(b)	8(c)	3(c)[6]
4.1(b)			4.2(b)	4.2(b)	4.3(a)	4.3(b)	4.3(b)	5.1(a)	4.1(b)	4.1(b)	6.1(a)	6.1(a)	SOL LIQ 4.1(b)6.1(b)	SOL LIQ 4.1(b)6.1(b)	8(a)	SOL LIQ 4.1(b)8(b)	SOL LIQ 4.1(b)8(b)	4.1(b)
4.1(c)			4.2(b)	4.2(c)	4.3(a)	4.3(b)	4.3(c)	5.1(a)	4.1(b)	4.1(c)	6.1(a)	6.1(a)	6.1(b)	SOL LIQ 4.1(c)6.1(c)	8(a)	8(b)	SOL LIQ 4.1(c)8(c)	4.1(c)[6]
4.2(b)					4.3(a)	4.3(b)	4.3(b)	5.1(a)	4.2(b)	4.2(b)	6.1(a)	6.1(a)	4.2(b)	4.2(b)	8(a)	4.2(b)	4.2(b)	4.2(b)
4.2(c)					4.3(a)	4.3(b)	4.3(c)	5.1(a)	5.1(b)	4.2(c)	6.1(a)	6.1(a)	6.1(b)	4.2(c)	8(a)	8(b)	4.2(c)	4.2(c)[6]
4.3(a)								5.1(a)	4.3(a)	4.3(a)	6.1(a)	4.3(a)	4.3(a)	4.3(a)	4.3(a)	4.3(a)	4.3(a)	4.3(a)
4.3(b)								5.1(a)	4.3(b)	4.3(b)	6.1(a)	4.3(a)	4.3(b)	4.3(b)	8(a)	4.3(b)	4.3(b)	4.3(b)
4.3(c)								5.1(a)	5.1(b)	4.3(c)	6.1(a)	6.1(a)	6.1(b)	4.3(c)	8(a)	8(b)	4.3(c)	4.3(c)[6]
5.1(a)[1]											5.1(a)	5.1(a)	5.1(a)	5.1(a)	5.1(a)	5.1(a)	5.1(a)	5.1(a)
5.1(b)[1]											6.1(b)	5.1(a)	5.1(b)	5.1(b)	8(a)	5.1(b)	5.1(b)	5.1(b)
5.1(c)[1]											6.1(a)	6.1(a)	6.1(b)	5.1(c)	8(a)	8(b)	5.1(c)	5.1(c)[6]
6.1(a)[3] DERMAL															SOL LIQ 6.1(a)8(a)	6.1(a)	6.1(a)	6.1(a)
6.1(a)[3] ORAL															SOL LIQ 6.1(a)8(a)	6.1(a)	6.1(a)	6.1(a)
6.1(b)[3] INHAL															SOL LIQ 6.1(a)8(a)	6.1(b)	6.1(b)	6.1(b)
6.1(b)[3] DERMAL															SOL LIQ 6.1(a)8(a)	SOL LIQ 6.1(b)8(b)	6.1(b)	6.1(b)
6.1(b)[3] ORAL															8(a)	SOL LIQ 6.1(b)8(b)	6.1(b)	6.1(b)
6.1(c)[3]															8(a)	8(b)	8(c)	6.1(c)[6]
8(a)[4]																		8(a)
8(b)[4]																		8(b)
8(c)[4]																		8(c)[6]

SOL - Solid mixtures.
LIQ - Liquid mixtures and solutions.
Dermal - Dermal toxicity.
Oral - Oral toxicity.
Inhal. - Toxicity on inhalation.

2003 (4) (cont'd) ...

Appendix A.6: General conditions for the use of intermediate bulk containers (IBCs), types of IBCs, requirements relating to the construction of IBCs and test specifications for IBCs;

2006 (3) Insert the following paragraph (3):

"(3) In article 1(c) of ADR the word "vehicles" need not refer to one and the same vehicle. An international operation may be performed by several different vehicles provided that the operation takes place on the territory of at least two Contracting Parties to ADR between the consignor and the consignee indicated in the transport document."

2007 Delete subparagraph (c); (d) becomes (c).

CLASS 1

2100(1) To read as follows:

"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 in marginal 2101 are to be accepted for carriage. These substances and articles are only to be accepted for carriage subject to conditions set out in marginals 2100 (2) to 2116, Appendix A.1 and Annex B. They are then considered as substances and articles of ADR."

(2) In Note 3, after "marginal 2101" insert: "and those containing plasticizers"; amend "7°(a), 20° and 21°" to "21°, 22° and 24°".

(3) Add:

" ... or shall be assigned to an n.o.s. entry in marginal 2101 in accordance with these test methods and classification procedures.

Assignment of substances and articles not mentioned by name to an n.o.s. entry shall be made by the competent authority of the country of origin.

Substances and articles which are assigned to an n.o.s. entry shall be carried only with the approval of the competent authority of the country of origin and under the conditions laid down by that authority.

If the country of origin is not party to ADR, the conditions laid down shall be recognized by the competent authority of the first ADR country reached by the consignment.

The approval shall be issued in writing."

(8) Amend to read:

"Substances of compatibility group A and articles of compatibility group K, in accordance with paragraph (7), shall not be accepted for carriage."

2101 Amend the beginning of the second sentence to read:

"Explosive substances and articles listed in marginal 3170 can ...."

Table 1 - Insert the following additional entries:

2101 (cont'd)

Item	Identification numbers and name of the substance or article 1/	Classification code in accordance with marginal 2100(6) and (7)	Packing	
			Packing methods (see marginal 2103(5))	Special packing requirements (see marginal 2103(6))
1	2	3	4	5
11°	SUBSTANCES CLASSIFIED AS 1.1L			
	0357 Substances, explosive, n.o.s. 2/	1.1L	E103	-
12°	ARTICLES CLASSIFIED AS 1.1L			
	0354 Articles, explosive, n.o.s. 2/	1.1L	E103	-
24°	SUBSTANCES CLASSIFIED AS 1.2L			
	0358 Substances, explosive, n.o.s. 2/	1.2L	E103	-
25°	ARTICLES CLASSIFIED AS 1.2L			
	0248 Contrivances, water-activated with burster, expelling charge or propelling charge	1.2L	E123	29, 35, 49
	0322 Rocket motors with hypergolic liquids with or without expelling charge	1.2L	E149	42, 50
	0355 Articles, explosive, n.o.s. 2/	1.2L	E103	-
	0380 Articles, pyrophoric	1.2L	E103	-
33°	SUBSTANCES CLASSIFIED AS 1.3L			
	0359 Substances, explosive, n.o.s. 2/	1.3L	E103	-
34°	ARTICLES CLASSIFIED AS 1.3L			
	0249 Contrivances, water-activated with burster, expelling charge or propelling charge	1.3L	E123	29, 35, 49
	0250 Rocket motors with hypergolic liquids, with or without expelling charge	1.3L	E149	42, 50
	0356 Articles, explosive, n.o.s. 2/	1.3L	E103	-
44°	SUBSTANCES CLASSIFIED AS 1.4L (Reserved)	1.4L		
45°	ARTICLES CLASSIFIED AS 1.4L (Reserved)	1.4L		

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

1	2		3	4	5
1°	0461	Components, explosive train, n.o.s. 2/	1.1B	E 103	
2°	0474	Substances, explosive, n.o.s. 2/	1.1C	E 103	
3°	0462	Articles, explosive, n.o.s. 2/	1.1C	E 103	
4°	0475	Substances, explosive, n.o.s. 2/	1.1D	E 103	
5°	0463	Articles, explosive, n.o.s. 2/	1.1D	E 103	
6°	0464	Articles, explosive, n.o.s. 2/	1.1E	E 103	
7°	0465	Articles, explosive, n.o.s. 2/	1.1F	E 103	
8°	0476	Substances, explosive, n.o.s. 2/	1.1G	E 103	
11°	0382	Components, explosive train, n.o.s. 2/	1.2B	E 103	
13°	0466	Articles, explosive, n.o.s. 2/	1.2C	E 103	
15°	0467	Articles, explosive, n.o.s. 2/	1.2D	E 103	
16°	0468	Articles, explosive, n.o.s. 2/	1.2E	E 103	
17°	0469	Articles, explosive, n.o.s. 2/	1.2F	E 103	
22°	0132	Deflagrating metal salts of aromatic nitro-derivatives, n.o.s. 2/	1.3C	E 103	
	0203	Sodium salts of aromatic nitro-derivatives, n.o.s. 2/	1.3C	E 103	
	0477	Substances, explosive, n.o.s. 2/	1.3C	E 103	
23°	0470	Articles, explosive, n.o.s. 2/	1.3C	E 103	
25°	0478	Substances, explosive, n.o.s. 2/	1.3G	E 103	
29°	0350	Articles, explosive, n.o.s. 2/	1.4B	E 103	
	0383	Components, explosive train, n.o.s. 2/	1.4B	E 103	
30°	0479	Substances, explosive, n.o.s. 2/	1.4C	E 103	
31°	0351	Articles, explosive, n.o.s. 2/	1.4C	E 103	
32°	0480	Substances, explosive, n.o.s. 2/ (The word "Reserved" is deleted.)	1.4D	E 103	
33°	0352	Articles, explosive, n.o.s. 2/	1.4D	E 103	
34°	0471	Articles, explosive, n.o.s. 2/	1.4E	E 103	
35°	0472	Articles, explosive, n.o.s. 2/	1.4F	E 103	
36°	0485	Substances, explosive, n.o.s. 2/ (The word "Reserved" is deleted.)	1.4G	E 103	
37°	0353	Articles, explosive, n.o.s. 2/	1.4G	E 103	
38°	0481	Substances, explosive, n.o.s. 2/ (The word "Reserved" is deleted.)	1.4S	E 103	
39°	0349	Articles, explosive, n.o.s. 2/	1.4S	E 103	
	0384	Components, explosive train, n.o.s. 2/	1.4S	E 103	
40°	0482	Substances, explosive, very insensitive, n.o.s. 2/	1.5D	E 103	

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

2101
(cont'd) In Table 1, re-number existing "11° - 21°" as "13° - 23°";
"22° - 28°" as "26° - 32°";
"29° - 37°" as "35° - 43°";
"38° - 41°" as "46° - 49°".

Table 1 (existing item numbers)

3° For the entries 0271 and 0273, amend columns 4 and 5 to read: "E 158 8,10,54."

4° At the end add the following:

"0489	Dinitroglycoluril (DINGU)	1.1 D	E2	1
0490	Nitrotriazolone (NTO)	1.1 D	E2	1"

The end of the Note to the entry 0402 is amended to read: "(marginal 2501, 12° (b))".

13° Entries 0415, 0416) Amend columns 4 and 5 to read:
23° Entries 0272, 0274) "E 158 8,10,54"

22° The end of the Notes to entries 0342 and 0343 is amended to read: "(marginal 2401, 24° (a))".

2102(2) Replace "3512" by "3511" (2)".

2103(5) Insert the following new packing methods in Table 2.

Method	Inner packagings	Outer packagings
"E 123	Dividing partitions in the outer packaging Receptacles fibreboard metal	Boxes natural wood, ordinary (4C1) with metal liner plywood (4D) with metal liner reconstituted wood (4F) with metal liner steel (4A1)"
"E 149	As specified by the competent authority in the country of origin 2/	Boxes natural wood, ordinary (4C1) plywood (4D) reconstituted wood (4F) solid plastics (4H2) steel (4A1)"

2103 (5)
(cont'd)

"E 158		
(a)	Bags paper, kraft plastics textile textile, rubberized	Boxes fibreboard (4G) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) solid plastics (4H2) Drums steel, removable head (1A2) fibre (1G) plywood (1D)
(b)	Receptacles fibreboard metal plastics	Boxes fibreboard (4G) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) solid plastics (4H2)
(c)		Composite packagings Receptacles, plastics, in a box of solid plastics material (6HH2)"

Amend further packing methods in Table 2 as follows:

E 115 delete "37°"; insert "43°";
delete "39°"; insert "47°".

E 145 delete "39°"; insert "47°".

E 130 : Under "Outer packagings", after "Drums fibre" add: "plastics, removable head (1H2)".

2103 (6) Add special packing requirements 29, 35, 42, 49, 50 (as in English Orange Book)

2104 (1) First sentence to read as follows:

"Substances and articles covered by the same identification number 4/, with the exception of substances and articles of Compatibility Group L and substances and articles assigned to an n.o.s. entry, may be packed together."

Insert new paragraph (7):

"(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".

Renumber existing paragraphs "(7)" to "(10)" as "(8)" to "(11)".

2104 (cont'd) In Table 4, amend the item numbers as follows:

Delete "19°"; insert "21°";
Delete "22°"; insert "26°";
Delete "23°"; insert "27°";
Delete "26°"; insert "30°";
Delete "37°"; insert "43°";
Delete "39°"; insert "47°".

2105 Before (1) insert the subheading "Marking".

2105 (1) After the first sentence insert the following:

"For substances and articles assigned to an n.o.s. entry, 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."

In third sentence, replace "40°" by "48°".

Before (2) insert the subheading "Danger labels".

In (2), first sentence, replace "28°" by "34°". Second sentence replace "29°-39°, 40°, 41°" by "35°-47°, 48°, 49°".

In (3), replace "19°, 22°, 26°, 37°" by "21°, 26°, 30°, 43°" and "19°, 26°, 37°" by "21°, 30°, 43°".

2110 (1) Same amendment as in 2105 (1).

(2) Replace "40°" by "48°".

In the second sentence delete "underlined and".

Add new paragraph (5) as follows:

"(5) For the carriage of substances and articles assigned to an n.o.s. entry, 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."

2115 (3) Delete the last sentence.

2117 Delete the heading E and this marginal.

CLASS 2

2200 (3) Amend final sentence to read as follows:
"The names of corrosive or oxidizing gases and of articles containing such gases shall be followed respectively by the words "corrosive" or "oxidizing" in brackets."

2201

1°(a) After "oxygen" add "(oxidizing)".

1°(at) For "fluorine" replace "(corrosive)" by "(oxidizing)".

2°(a) Add the following Note:

"NOTE: Mixtures containing more than 25 % (volume) oxygen are regarded as oxidizing."

3°(at) After "... N_2O_4)" replace "(corrosive)" by ("oxidizing)".

5°(a) After "nitrous oxide N_2O" add "(oxidizing)".

7°(a) Same amendment as in 5°(a), and add "(oxidizing)" after "oxygen".

8°(a) Add the following Note:

"NOTE: Mixtures of 8°(a) containing more than 32 % (mass) nitrous oxide, air and mixtures containing more than 20 % (mass) oxygen are regarded as oxidizing."

Add new entries as follows:

1°(at) "nitrogen trifluoride"

3°(a) "1-chloro-1,2,2,2-tetrafluoroethane (R 124), octafluorobut-2-ene (R 1318), octafluoropropane, 1,1,1,2-tetrafluoroethane (R 134a)"

3°(at) "hexafluoroacetone"

3°(b) "2,2-dimethylpropane"

3°(bt) "carbonyl sulphide (corrosive)"

3°(c) "propadiene, inhibited"

3°(ct) "hydrogen iodide, anhydrous (non-flammable) (corrosive)"

4°(at) "Mixtures of dichlorodifluoromethane and ethylene oxide containing not more than 12 % (mass) ethylene oxide"

4°(c) Underline "Mixtures of 1,3-butadiene and hydrocarbons"

Add:

"propadiene with 1 % to 4 % methyl acetylene, stabilized"

4°(ct) Delete "dichlorodifluoromethane containing 12 % ethylene oxide by mass".

Underline "ethylene oxide with nitrogen"

2201 (cont'd) 5°(a) Add: "pentafluoroethane (R 125)"

8°(b) Add: "mixture of at least 71.5 % ethylene (volume) with not more than 22.5 % acetylene (volume) and not more than 6 % propylene (volume)."

2207 (1) Amend to read as follows:

"Gases of 7° and 8° shall be enclosed in metal receptacles which are so insulated that they cannot become coated with dew or hoar-frost. The receptacles shall be fitted with safety valves".

(2) Amend to read as follows:

"Gases of 7° (a) other than carbon dioxide and 8° (a) other than mixtures containing carbon dioxide may also be enclosed in receptacles which are not hermetically closed and which are:

(a) (unchanged)

(b) (unchanged).

2212 (1) (b) Add at the end:

"with the exception of receptacles in conformity with (e)".

Add new subparagraph (e) as follows:

"(e) receptacles in conformity with marginal 2207, of a capacity of not more than 1,000 litres."

(3) (b) and (c)

Before:	Insert:
"and silicon tetrafluoride"	", nitrogen trifluoride"
"boron trichloride"	"octafluorobut-2-ene (R 1318) and octafluoropropane of 3° (a);"
"nitrosyl chloride"	"hexafluoroacetone,"
"methylsilane"	2,2-dimethylpropane and"
"dichlorosilane"	"carbonyl sulphide,"
"cyanogen chloride"	"propadiene, inhibited, of 3° (c);"

Amend "cyanogen and ethylene oxide" to read:

2212 (3) (cont'd) "cyanogen, ethylene oxide and hydrogen iodide, anhydrous,"

In (b) only, after "of 4° (bt)" insert:

"propadiene with 1 % to 4 % methyl acetylene, stabilized, of 4° (c);"

In (c), after "4° (c) and 4° (ct)" delete:

"other than dichlorodifluoromethane containing 12 % ethylene oxide by mass"

Add new subparagraph (d) as follows:

"(d) For receptacles conforming to (1) (e), see marginal 2207."

2214 (4) After "of 4° (c)" insert:

", mixture of ethylene with acetylene and propylene of 8° (b)".

2216 (1) After subparagraph (d) add the following:

"NOTE: With the agreement of the expert 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."

(3) After the first sentence add the following:

"NOTE: With the agreement of the expert approved by the competent authority, the hydraulic pressure test may be replaced by an equivalent method based on ultrasound."

2219 (6) Replace the first sentence with the following text:

"The degree of filling of receptacles in conformity with marginal 2207 (1) intended for the carriage of gases of 7° (b) and 8° (b) shall remain below the level at which, if the contents were raised to the temperature at which the vapour pressure equalled the valve-opening pressure, the volume of the liquid would reach 95 % of the capacity of the receptacle at that temperature. Receptacles intended for the carriage of gases of 7° (a) and 8° (a) may be filled to 98 % at the loading temperature and the loading pressure."

2220 (2) Delete the last entry in the table. Before "Mixtures of methyl bromide and chloropicrin" insert:

"Mixtures of dichlorodifluoromethane and ethylene oxide containing not more than 12 % ethylene oxide by mass	4°	(at)	1.8	1.09"

Insert the following new entries:

"1-chloro-1,2,2,2-tetrafluoroethane (R 124)	3°	(a) 1.2	(12)	1.20
"1-chloro-1,2,2,2-tetrafluoroethane (R 124)	3°	(a) 1.2	(12)	1.20
Octafluorobut-2-ene (R 1318)	3°	(a) 1.2	(12)	1.34

2220 (2) (cont'd)	Octafluoropropane	3°	(a)	2.5	(25) 1.09
	1,1,1,2-tetrafluoroethane (R 134a)	3°	(a)	2.2	(22) 1.04
	Hexafluoroacetone	3°	(at)	2.2	(22) 1.08
	2,2-Dimethylpropane	3°	(b)	1.0	(10) 0.53
	Carbonyl sulphide	3°	(bt)	2.6	(26) 0.84
	Propadiene, inhibited	3°	(c)	2.2	(22) 0.50
	Hydrogen iodide, anhydrous	3°	(ct)	2.3	(23) 2.25
	Propadiene with 1 % to 4 % methyl acetylene, stabilized	4°	(c)	2.2	(22) 0.50"

(3) After nitrous oxide insert the following new entry:

	"Pentafluoroethane (R 125)	5°	(a)	3.6	(36) 0.95"

2223 Above the text insert the subheading "Marking".

2224 Insert the subheading "Danger labels" above the text, which is amended to read:

"NOTE: A package is any packaging containing receptacles, aerosol dispensers or non-refillable containers of gas under pressure, or any receptacle without outer packaging."

Amend to read as follows:

"(1) Packages containing substances and articles of Class 2 other than those mentioned in paragraph (2), Table 2 and in paragraph (3) of this marginal, shall bear the labels indicated below:

Table 1

Substances and articles	Label model Nos.
Classified under (a)	2
Classified under (at)	6.1
Classified under (b)	3
Classified under (bt)	6.1 + 3
Classified under (c)	3
Classified under (ct)	6.1 + 3

(2) Packages containing substances and articles described in Table 2 below shall bear the labels indicated:

2224
(cont'd)

Table 2

Item No.	Substances and articles	Label model Nos.
1° (a)	Oxygen	2 + 05
1° (at)	Fluorine	6.1 + 05
1° (at)	Silicon tetrafluoride	6.1 + 8
1° (ct)	Nitric oxide	6.1
2° (a)	Mixtures with more than 25 % oxygen (volume)	2 + 05
3° (at)	Boron chloride, chlorine, chlorine trifluoride, hydrogen bromide, nitrosyl chloride and phosgene	6.1 + 8
3° (at)	Nitrogen dioxide	6.1 + 05
3° (bt)	Carbonyl sulphide	3 + 6.1 + 8
3° (ct)	Cyanogen chloride, hydrogen iodide, anhydrous	6.1 + 8
5° (a)	Nitrous oxide	2 + 05
5° (at)	Hydrogen chloride	6.1 + 8
7° (a)	Oxygen, nitrous oxide	2 + 05
8° (a)	Air and mixtures containing more than 20 % oxygen (mass), mixtures containing more than 32 % nitrous oxide (mass)	2 + 05
10° (a)	Aerosol dispensers	No label
10° (b)1	Aerosol dispensers	No label
10° (bt)1	Aerosol dispensers	6.1

(3) In conformity with the dangerous properties of the substances, packages containing substances of 12° and 13° shall bear:

a label conforming to model No. 3 for flammable gases,

a label conforming to model No. 6.1 for toxic gases,

labels conforming to model Nos. 6.1 and 8 for corrosive gases,

labels conforming to model Nos. 2 and 05 for oxidizing gases,

labels conforming to model Nos. 6.1 and 3 for flammable toxic gases,

labels conforming to model Nos. 3, 6.1 and 8 for flammable corrosive gases,

a label conforming to model No. 2 for gases which are not flammable, toxic, corrosive or oxidizing,

labels conforming to model Nos. 6.1 and 05 for mixtures containing fluorine and those containing nitrogen dioxide."

(4) Existing text of (1)

(5) Existing text of (2), amending "7° (a) or 8° (a)" to "7° or 8°",

2224 (cont'd) "(6) Labels on gas cylinders may be attached to the shoulder of the cylinder and may have smaller dimensions accordingly, provided that they remain clearly visible."

2225 [This marginal is deleted.]

2226 (1) (b) After "4° (c)," insert "4° (ct)," and add the following sentence:

"In the case of mixtures A, AO and C of 4° (b) carried in tanks or tank-containers, however, the names customary in the trade mentioned in the NOTE may be used only as a complement."

In the sentence beginning "These descriptions must be underlined and followed by ...", delete "underlined and"

2237 Renumber (2) and (3) as (3) and (4). Insert the following new paragraph (2):

"(2) Uncleaned empty receptacles of 14° shall bear the same danger labels as if they were full."

Delete the second sentence of the old paragraph (2).

CLASS 3

2300 In footnote 1/, amend words in parenthesis to read:

"(see Appendix A.3, marginal 3310)".

2301 4° In the parenthesis towards the end of Note 1, for "22°" read "26°" and for "7° (a)" read "24°".

5° In the parenthesis towards the end of the Note, for "22°", read "26°".

21° Amend Note to read:

"NOTE: Chlorosilanes which, in contact with water, emit flammable gases are substances of Class 4.3 (see marginal 2471, 1°)."

In 31° and 32° add the following:

"Viscous substances, such as:

adhesives, enamels, paints, polishes, varnishes and certain colours for leathers and rotogravures, with the exception of substances containing nitrocellulose. 1/

At the end of the Notes to 33° (c) and 34° (c), amend "22°" to "26°" and "7° (a)" to "24° (a)" and "22°" to "26°".

2301a (1) (b) After "item" insert "except 5° (b)"; amend "6 litres" to "12 litres".

Insert the following new subparagraph (c):

"(c) Substances classified under 5° (b): not more than 5 litres per inner packaging and not more than 20 litres per package."

Existing (c) becomes (d); amend "3 litres" to "5 litres".

2302 (3) Amend "3600 (3)" to "3611 (2)".

2306 (3) Amend end to read:

"... may also be packed in metal IBCs conforming to marginal 3622, rigid plastics IBCs conforming to marginal 3624 or composite IBCs with rigid plastics inner receptacle conforming to marginal 3625."

2307 (2) Amend end to read:

"... may also be packed in metal IBCs conforming to marginal 3622, rigid plastics IBCs conforming to marginal 3624 or composite IBCs with rigid plastics inner receptacle conforming to marginal 3625."

Add the following new paragraph (3):

"(3) Substances of 32° (c) may also be packed in composite IBCs with flexible plastics inner receptacle conforming to marginal 3625."

2308 Add the following new paragraph (3) [after Notes 1 and 2]:

"(3) Viscous substances having a viscosity above 200 mm^2/s at 23° C (corresponding to a flow time of 30 seconds with an ISO flow cup having a jet orifice of 6 mm diameter in accordance with ISO Standard 2431-1984) may be carried in a quantity not exceeding 5 litres in metal or plastics packagings meeting only the requirements of marginal 3500 (1), (2) and (5) to (7), provided the packagings are secured on pallets by straps, shrink or stretch-wrapping or by other suitable means."

2309 In the NOTE, for "3601(8)" read "3621(8)".

1/ For substances not subject to the provisions of ADR, see NOTE under D."

2310 At the end, for "3607 (5)" read "3601 (6)".

2312 Above the text insert subheading "Danger labels".

Delete the second sentence of paragraph (1).

2314 (1) In the fourth sentence, delete "underlined and".

Amend the last sentence to read:

"For the carriage of solutions and mixtures (such as preparations and wastes) containing several components subject to the provisions of ADR, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures."

2322 (3) Delete the second sentence.

CLASS 4.1 FLAMMABLE SOLIDS

1. List of substances

2400 (1) Among the substances and articles covered by the title of Class 4.1, those which are listed in marginal 2401 or are covered by a collective entry in that marginal are subject to the conditions set out in marginals 2400 (2) to 2422 and to the provisions of this Annex and of Annex B. They are then considered as substances and articles of ADR.

NOTE: For the quantities of substances listed in marginal 2401 which are not subject to the provisions for this Class, either in this Annex or in Annex B, see marginal 2401a.

(2) The title of Class 4.1 covers substances and articles which at a temperature of 35° C are solid or pasty. The following are assigned to Class 4.1:

- readily flammable solid substances and articles, and those which can be ignited by flying sparks or can cause or contribute to fire through friction;

- self-reactive substances which (at normal or elevated temperatures), are liable to undergo strongly exothermal decomposition caused by excessively high transport temperatures or by contamination;

- explosives, which are wetted with such a quantity of water or alcohol or which contain such a quantity of plasticizing or inerting agent, that their explosive properties are neutralized.

NOTE: To determine the pasty state at 35° C the penetrometer procedure shall be applied (see Appendix A.3 marginal 3310).

(3) The substances and articles of Class 4.1 are subdivided as follows:

A Solid organic flammable substances and articles

B Solid inorganic flammable substances and articles

2400 (3) (cont'd)

C Explosive substances in non-explosive state

D Self-reactive substances

E Empty packagings

Substances and articles of Class 4.1, with the exception of substances of 5° and 15°, classified under the various items of marginal 2401, shall be assigned to one of the following groups designated by the letter (a), (b) or (c) according to their degree of danger:

(a) very dangerous
(b) dangerous
(c) less dangerous

All solid substances, normally wetted, which, if in the dry state, would be classified as explosives, are assigned to letter (a) of the various items.

2400 (4) Self-reactive substances are assigned to letter (b) of the various items.

The assignment of substances and articles not specifically named to 3° to 8° of marginal 2401, as well as within these items to the letters, can be based on experience or on the results of the test procedures in accordance with Appendix A.3, marginals 3320 and 3321. Assignment to 11° to 14°, 16° and 17° as well as within these items to the letters, shall be based on the results of the test procedure in accordance with Appendix A.3, marginals 3320 and 3321; experience shall also be taken into account when it leads to a more strictly-based assignment.

(5) When substances or articles not specifically named are assigned to the items of marginal 2401 on the basis of the test procedures in accordance with Appendix A.3, marginals 3320 and 3321, the following criteria apply:

(a) Readily flammable powdery, granular or pasty substances of 1°, 4°, 6° to 8°, 11°, 12°, 14°, 16° and 17°, shall be assigned to Class 4.1 if they can be easily ignited by brief contact with an ignition source (e.g a burning match), or if, in the event of ignition, the flame spreads rapidly, the combustion time is less than 45 seconds for a measured distance of 100 mm or the speed of combustion is greater than 2.2 mm/s.

(b) Metal powders or powders of metal alloys of 13° shall be assigned to Class 4.1 if they can be ignited by a flame and the reaction spreads over the whole sample in less than 10 minutes.

(6) When substances and articles not specifically named are assigned to the letters of the items of marginal 2401 on the basis of test procedures in accordance with Appendix A.3, marginals 3320 and 3321, the following criteria apply:

(a) Flammable solids of 4°, 6° to 8°, 11°, 12°, 14°, 16° and 17°, which, when tested, have a combustion time of less than 45 seconds over a measured distance of 100 mm shall be assigned to letter (b) if:

2400 (6) (cont'd)

(i) the flame passes the wetted zone;

to letter (c) if

(ii) the wetted zone stops the flame for at least four minutes;

(b) Metal powders or powders of metal alloys of 13° in which, when tested, the reaction:

(i) spreads over the whole length of the sample in five minutes or less,
shall be assigned to letter (b);

(ii) spreads over the whole length of the sample in more than five minutes shall be assigned to letter (c).

(7) If substances of Class 4.1, as a result of admixtures, come into different categories of risk from those to which the substances of marginal 2401 belong, these mixtures shall be assigned to the items and letters to which they belong on the basis of their actual degree of danger.

NOTE: For the classification of solutions and mixtures (such as preparations and wastes) see also marginal 2002 (8).

2400 (8) When substances and articles are specifically named under more than one letter of the same item of marginal 2401, the relevant letter may be determined on the basis of the results of the test procedures in accordance with Appendix A.3, marginals 3320 and 3321 and the criteria set out in (6).

(9) On the basis of the test procedures in accordance with Appendix A.3, marginals 3320 and 3321 and the criteria set out in (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 2414).

(10) The chemically unstable substances of Class 4.1 are to be accepted for carriage only if the necessary steps have been taken to prevent their dangerous decomposition or polymerization during carriage. To this end, it shall in particular be ensured that receptacles do not contain any substance liable to promote these reactions.

(11) Flammable solids, oxidizing, assigned to identification number 3097 of the United Nations Recommendations shall not be accepted for carriage (see, however, marginal 2002 (8), footnote[1/] to the table in paragraph 2.3.1).

2401 A. Solid organic flammable substances and articles

1° Substances obtained from the processing of rubber in flammable form:

(b) 1345 rubber scrap, ground or 1345 rubber shoddy, powdered or granulated.

2401 2° (cont'd) Flammable articles in commercial form:

(c) 1331 matches, "strike anywhere", 1944 matches, safety (book, card or box), 1945 matches, wax, 2254 matches, fusee, 2623 firelighters, solid, with flammable liquid.

3° Articles made from weakly nitrated nitrocellulose:

(c) 1324 films, nitrocellulose base, gelatin-coated, except scrap, 2000 celluloid in block, rods, rolls, sheets, tubes, etc., except scrap, 1353 fibres impregnated with weakly nitrated nitrocellulose, n.o.s. or 1353 fabrics impregnated with weakly nitrated nitrocellulose, n.o.s.

NOTE: 2006 plastics, nitrocellulose-based, self-heating, n.o.s., and 2002 celluloid scrap are substances of Class 4.2 (see marginal 2431, 4°).

4° (c) 3175 solids or mixtures of solids (such as preparations and wastes) containing flammable liquid n.o.s. having a flash-point up to 100° C.

5° Organic flammable substances in the molten state:

2304 naphthalene, molten,
3176 flammable solid, organic, molten, n.o.s.

NOTE: 1334 naphthalene, crude or refined, is a substance of 6°.

6° Organic flammable solids, non-toxic and non-corrosive, and mixtures of organic flammable solids, non-toxic and non-corrosive (such as preparations and wastes), which cannot be classified under other collective entries:

(b) 1325 flammable solid, organic, n.o.s.;

(c) 1312 borneol, 1328 hexamine, 1332 metaldehyde, 1334 naphthalene, crude or 1334 naphthalene, refined, 2213 paraformaldehyde, 2538 nitronaphthalene, 2717 camphor, synthetic, 1325 flammable solid, organic, n.o.s.

NOTE: 2304 naphthalene, molten, is a substance of 5°.

7° Organic flammable solids, toxic, and mixtures of organic flammable solids, toxic (such as preparations and wastes), which cannot be classified under other collective headings:

(b) 2926 flammable solid, organic, toxic, n.o.s.;

(c) 2926 flammable solid, organic, toxic, n.o.s.

NOTE: For toxicity criteria, see footnote 1/ to marginal 2600 (1).

2401 (cont'd)

8° Organic flammable solids, corrosive, and mixtures of organic flammable solids, corrosive (such as preparations and wastes), which cannot be classified under other collective headings:

(b) 2925 flammable solid, organic, corrosive, n.o.s.;

(c) 2925 flammable solid, organic, corrosive, n.o.s.

NOTE: For corrosivity criteria see footnote 1/ to marginal 2800 (1).

B. Solid inorganic flammable substances and articles

11° Inorganic non-metallic substances in flammable form:

(b) 1339 phosphorus heptasulphide (P_4S_7) free from yellow and white phosphorus, 1341 phosphorus sesquisulphide (P_4S_3) free from yellow and white phosphorus, 1343 phosphorus trisulphide (P_4S_6) free from yellow and white phosphorus, 2989 lead phosphite , dibasic, 3178 flammable solid, inorganic, n.o.s.;

NOTE: Phosphorus sulphides which are not free from yellow and white phosphorus shall not be accepted for carriage.

(c) 1338 phosphorus, amorphous, 1350 sulphur (also flowers of sulphur), 2989 lead phosphite, dibasic, 3178 flammable solid, inorganic, n.o.s.

NOTE: 2448 sulphur, molten, is a substance of 15°.

12° Flammable metal salts of organic compounds:

(b) 3181 metal salts of organic compounds, flammable, n.o.s.;

(c) 1313 calcium resinate, 1314 calcium resinate, fused, 1318 cobalt resinate, precipitated, 1330 manganese resinate, 2001 cobalt naphthenates, powder, 2714 zinc resinate, 2715 aluminium resinate, 3181 metal salts of organic compounds, flammable, n.o.s.

13° Metals and metal alloys in powdered or other flammable form:

NOTE 1: Metals and metal alloys in powdered or other flammable form, liable to spontaneous combustion, are substances of Class 4.2 (see marginal 2431, 12°).

NOTE 2: Metals and metal alloys in powdered or other flammable form which, in contact with water, emit flammable gases are substances of Class 4.3 (see marginal 2471, 11° to 15°).

(b) 1309 aluminium powder, coated, 1323 ferrocerium, 1326 hafnium powder, wetted with not less than 25% (mass) water, 1333 cerium, slabs, rods, ingots, 1352 titanium powder, wetted with not less than 25% (mass) water, 1358 zirconium powder, wetted with not less than 25% (mass) water. 3089 metal powders, flammable, n.o.s.;

2401 (cont'd)

NOTE 1: Hafnium, titanium and zirconium powders shall contain a visible excess of water.

NOTE 2: Hafnium, titanium and zirconium powders, wetted, mechanically produced, of a particle size of 53 microns and over, or chemically produced, of a particle size of 840 microns and over, are not subject to the provisions of ADR.

(c) 1309 aluminium powder, coated, 1346 silicon powder, amorphous, 1869 magnesium or 1869 magnesium alloys, pellets, turnings or ribbons, 2858 zirconium, dry, coiled wire, finished metal sheets, strip (thinner than 254 microns but not thinner than 18 microns), 2878 titanium sponge granules or 2878 titanium sponge powders,
3089 metal powders, flammable, n.o.s.

NOTE 1: Magnesium alloys with not more than 50% magnesium are not subject to the provisions of ADR.

NOTE 2: Silicon powder in any other form is not subject to the provisions of ADR.

NOTE 3: 2009 zirconium, dry, finished sheets, strip or coiled wire, in thicknesses of less than 18 microns, is a substance of Class 4.2 (see marginal 2431, 12° (c)). Zirconium, dry, finished sheets, strip or coiled wire, in thicknesses of 254 microns or more, is not subject to the provisions of ADR.

14° Flammable metal hydrides:

(b) 1437 zirconium hydride, 1871 titanium hydride, 3182 metal hydrides, flammable, n.o.s.;

(c) 3182 metal hydrides, flammable, n.o.s.

NOTE 1: Metal hydrides which, in contact with water, emit flammable gases are substances of Class 4.3 (see marginal 2471, 16°).

NOTE 2: 2870 aluminium borohydride or 2870 aluminium borohydride in devices is a substance of Class 4.2 (see marginal 2431, 17° (a)).

15° The following inorganic flammable substance in molten form:

2448 sulphur, molten.

NOTE 1: 1350 solid sulphur is a substance of 11° (c).

NOTE 2: Other inorganic flammable substances in molten form shall not be accepted for carriage.

2401
(cont'd)

16° Inorganic flammable solids, toxic, and mixtures of inorganic flammable solids, toxic (such as preparations and wastes), which cannot be classified under other collective headings:

(b) 1868 decaborane,
3179 flammable solid, inorganic, toxic, n.o.s.;

(c) 3179 flammable solid, inorganic, toxic, n.o.s.

NOTE: For toxicity criteria, see footnote 1/ to marginal 2600 (1).

17° Inorganic flammable solids, corrosive, and mixtures of inorganic flammable solids, corrosive (such as preparations and wastes), which cannot be classified under other collective headings:

(b) 3180 flammable solid, inorganic, corrosive n.o.s.;

(c) 3180 flammable solid, inorganic, corrosive, n.o.s.

NOTE: For corrosivity criteria, see footnote 1/ to marginal 2800 (1).

C. Explosive substances in the non-explosive state

NOTE 1: Explosive substances in the non-explosive state, other than those listed in 21° to 25°, shall not be accepted for carriage as substances of Class 4.1.

NOTE 2: Special packing requirements are applicable for substances of 21° to 26° (see marginal 2404).

21° The following water-wetted explosive substances:

(a) 1310 ammonium picrate, wetted with not less than 10% (mass) water,
1322 dinitroresorcinol, wetted with not less than 15% (mass) water,
1336 nitroguanidine (picrite), wetted with not less than 20% (mass) water,
1337 nitrostarch, wetted with not less than 20% (mass) water,
1344 trinitrophenol, wetted with not less than 30% (mass) water,
1347 silver picrate, wetted with not less than 30% (mass) water,
1349 sodium picramate, wetted with not less than 20% (mass) water,
1354 trinitrobenzene, wetted with not less than 30% (mass) water,
1355 trinitrobenzoic acid, wetted with not less than 30% (mass) water,
1356 trinitrotoluene, wetted with not less than 30% (mass) water,
1357 urea nitrate, wetted with not less than 20% (mass) water,
1517 zirconium picramate, wetted with not less than 20% (mass) water,
2852 dipicryl sulphide, wetted with not less than 10% (mass) water.

2401
(cont'd)

22° The following toxic water-wetted explosive substances:

(a) 1320 dinitrophenol, wetted with not less than 15% (mass) water,
1321 dinitrophenolates, wetted with not less than 15% (mass) water,
1348 sodium dininitro-o-cresolate, wetted with not less than 15% (mass) water.

NOTES on 21° and 22°:

NOTE 1: Explosive substances with a water content lower than the stated limits are substances of Class 1.

NOTE 2: The water shall be homogeneously distributed over the entire explosive substance. During carriage there shall not be any separation of the mixture which reduces the inerting effect.

NOTE 3: Water-wetted explosives shall not be capable of being brought to detonation by the action of the standard detonator 1/, and they shall not be capable of being brought to mass explosion by the effect of a powerful booster.

23° The following explosive substance rendered inert:

(b) 2907 isosorbide dinitrate mixture with not less than 60% lactose, mannose, starch or calcium hydrogen phosphate or with other phlegmatizers, provided that such phlegmatizer has inerting properties which are at least as effective.

24° The following nitrated cellulose mixtures:

(a) 2555 nitrocellulose with not less than 25% (mass) water,
2556 nitrocellulose with not less than 25% (mass) alcohol and not more than 12.6% nitrogen in the dry mass,
2557 nitrocellulose with not less than 18% (mass) plasticizing substances and not more than 12.6% nitrogen in the dry mass.

NOTE 1: 2556 nitrocellulose with not less than 25% (mass) alcohol, or 2557 nitrocellulose with not less than 18% (mass) plasticizing substance, and not more than 12.6% nitrogen in the dry mass, shall be packed in receptacles so constructed that explosion by reason of increased internal pressure is not possible.

NOTE 2: Nitrocellulose mixtures with a water content, alcohol content or plasticizer content lower than the stated limits are substances of Class 1 (see marginal 2101, 4° and 26°).

1/ See "Recommendations on the Transport of Dangerous Goods, Tests and Criteria", Part 1, Appendix 1, ST/SG/AC.10/11/Rev.1.

2401
(cont'd)

25° The following toxic azide:

(a) 1571 barium azide, wetted with not less than 50% (mass) water.

NOTE 1: Barium azide with a water content lower than the stated limit shall not be accepted for carriage.

NOTE 2: Aqueous solutions of barium azide are substances of Class 6.1 (see marginal 2601, 42° (b)).

26° The following trinitro compound:

(c) 2956 5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene).

D. Self-reactive substances

NOTE 1: Self-reactive substances other than those listed in 31° to 37° shall not be accepted for carriage as substances of Class 4.1.

NOTE 2: Special packing requirements are applicable for substances of 31° to 37° (see marginal 2405).

NOTE 3: Self-reactive substances of 34° to 37° shall be carried only under adequate conditions of refrigeration (see marginal 41 105).

31° The following organic nitroso compounds:

(b) 2972 N,N'-dinitrosopentamethylenetetramine, of not more than 82% with a phlegmatizer,
2973 N,N'-dinitroso-N,N'-dimethylterephthalamide as a paste with a concentration of not more than 72%.

32° The following organic hydrazides:

(b) 1. 2951 diphenyloxide-4,4'-disulphohydrazide;

2. 2970 benzene sulphohydrazide,
2971 benzene-1,3-disulphohydrazide as a paste with a concentration of not more than 52%.

33° The following organic azocompounds:

(b) 1. 3042 2-diazo-1-naphthol-4-sulphochloride,
3043 2-diazo-1-naphthol-5-sulphochloride,
3242 azodicarbonamide;

2. 2954 1,1'-azo-di-(hexahydrobenzonitrile)

3. 3033 3-chloro-4-diethylaminobenzenediazonium zinc chloride,
3034 4-dipropylaminobenzenediazonium zinc chloride,
3040 sodium-2-diazo-1-naphthol-4-sulphonate,
3041 sodium-2-diazo-1-naphthol-5-sulphonate.

2401
(cont'd)

34° The following self-reactive substances, which must be carried at a control temperature (see marginal 41 105 (2)):

(b) 2953 2,2'-azodi-(2,4-dimethylvaleronitrile),
2955 2,2'-azodi-(2,4-dimethyl-4-methoxyvaleronitrile).

35° The following self-reactive substances, which must be carried at a control temperature (see marginal 41 105 (2)):

(b) 1. 3035 3-(2-hydroxyethoxy)-4-pyrrolidin-1-yl benzenediazonium zinc chloride,
3036 2,5-diethoxy-4-morpholinobenzenediazonium zinc chloride,
3037 [4-benzyl-(ethyl)-amino]-3-ethoxybenzenediazonium zinc chloride,
3038 [4-benzyl-(methyl)-amino]-3-ethoxybenzenediazonium zinc chloride,
3039 4-dimethylamino-6-(2-dimethylaminoethoxy) -toluene-2-diazonium zinc chloride;

2. 2952 azodiisobutyronitrile;

3. 3030 2,2'-azodi-(2-methylbutyronitrile).

36° Self-reactive substances, samples:

NOTE : Only substances whose properties have not yet been fully determined 1/ but which are not more dangerous than those referred to in 31° to 35° shall be assigned to this item number.

(b) 3031 self-reactive substance, sample, n.o.s. (such as aliphatic azocompounds, aromatic sulphohydrazides, N-nitroso compounds, diazonium salts).

37° Self-reactive substances, trial quantities:

NOTE. Only substances whose properties have not yet been fully determined 1/ shall be assigned to this item number.

(b) 3032 self-reactive substance, trial quantity, n.o.s. (such as aliphatic azocompounds, aromatic sulphohydrazides, N-nitroso compounds, diazonium salts).

1/ See "Recommendations on the Transport of Dangerous Goods" (ST/SG/AC.10/1/Rev.7), paragraph 14.2.3.

2401
(cont'd)

E. Empty packagings

41° Empty packagings, including empty intermediate bulk containers (IBCs), empty tank-vehicles, empty demountable tanks, and empty tank-containers, uncleaned, as well as empty vehicles for carriage in bulk and empty small bulk containers, uncleaned which have contained substances of 4° to 8°, 11°, 12°, water-wetted substances of 13°(b), substances of 14° to 17°, 21° to 26° and 31° to 37°.

2401a 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):

(a) Substances classified under (b) of each item, up to 3 kg per inner packaging 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 conditions of marginal 3538.

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

2. Provisions

A. Packages

1. General conditions of packing

2402 (1) Packagings shall satisfy the conditions of Appendix A.5, unless special conditions are prescribed in marginals 2403 to 2405 and 2408 for the packing of certain substances.

Intermediate bulk containers (IBCs) shall conform to the conditions of Appendix A.6.

(2) In accordance with the provisions of marginals 2400 (3) and 3511 (2) or 3611 (2) respectively, the following shall be used:

packagings of packing group I, marked with the letter "X", for very dangerous substances classified under (a) of each item;

packagings of packing groups II or I, marked with the letter "Y" or "X", or IBCs of packing group II, marked with the letter "Y", for dangerous substances classified under (b) of each item;

packagings of packing groups III, II or I, marked with the letter "Z", "Y" or "X", or IBCs of packing groups III or II, marked with the letter "Z" or "Y", for less dangerous substances classified under (c) of each item.

NOTE: For the carriage of substances of Class 4.1 in tank-vehicles, demountable tanks and tank-containers, as well as for carriage in bulk, see Annex B.

2. Special conditions for packing of certain substances

2403 Substances of 5° and molten sulphur of 15° may be carried only in tank-vehicles (see Appendix B.1a) or in tank-containers (see Appendix B.1b).

2404 (1) Substances of 21°, 22°, 23° and 25° shall be packed:

(a) in drums conforming to marginal 3523 for plywood, marginal 3525 for fibreboard or marginal 3526 for plastics material, in each case with one or more moisture-proof inner bags, or

(b) in combination packagings conforming to marginal 3538 with moisture-proof inner packagings. However, no inner or outer packagings of metal shall be permitted.

The packagings shall be so designed that the water content or the content of phlegmatizer, which is added to the substance to render it inert, cannot diminish during carriage.

(2) Substances of 24° shall be packed in:

(a) removable-head steel drums conforming to marginal 3520, or

(b) removable-head aluminium drums conforming to marginal 3521, or

(c) removable-head steel jerricans conforming to marginal 3522, or

(d) plywood drums conforming to marginal 3523, or

(e) fibre drums conforming to marginal 3525, or

(f) fibreboard boxes conforming to marginal 3530, or

(g) steel or aluminium boxes conforming to marginal 3532, or

(h) combination packagings conforming to marginal 3538; however, no inner or outer packagings of metal shall be permitted.

Metal receptacles shall be so constructed and closed that they yield to an internal pressure of not more than 300 kPa (3 bar).

2555 nitrocellulose with not less than 25% (mass) water may also be packed in plastics drums and jerricans conforming to marginal 3526.

If 2557 nitrocellulose with not less than 18% (mass) plasticizing substance and not more than 12.6% nitrogen in the dry mass is packed in metal receptacles, an inner bag of multi-wall paper shall be used.

If 2555 nitrocellulose with not less than 25% (mass) water or 2556 nitrocellulose with not less than 25% (mass) alcohol is packed in plywood drums, fibre drums or fibreboard boxes, a moisture-proof inner bag, a plastics film lining or an inner coating of plastics material shall be used.

All packagings shall be so designed that the water, alcohol or phlegmatizer content cannot diminish during carriage.

2404
(cont'd)

(3) The substance of 26° shall be packed in fibre drums conforming to marginal 3525 with a plastics lining or an equally effective inner coating. A package shall not weigh more than 50 kg.

2405 Substances of 31° to 37° shall be packed as follows:

(1) (a) Substances of 31° shall be packed in sift-proof fibre drums conforming to marginal 3525; a package shall not weigh more than 50 kg;

(b) 2973 N,N'-dinitroso-N,N'-dimethylterephthalamide may also be packed in combination packagings with a fibreboard outer packaging conforming to marginal 3525 or 3530. The following inner packagings may be used: plastics bags, boxes, bottles or jars. An inner packaging shall not weigh more than 5 kg and a package shall not weigh more than 25 kg.

(c) 2972 N,N'-dinitrosopentamethylene tetramine may also be packed:

in fibre drums conforming to marginal 3525, with a plastics lining or a plastics internal coating; a package shall not weigh more than 50 kg;

in combination packagings with a fibreboard outer packaging conforming to marginal 3538. The following inner packagings may be used:

plastics boxes, bottles or jars; these inner packagings shall not weigh more than 5 kg and a package shall not weigh more than 40 kg;

an individually packed plastics bag: a package shall not weigh more than 50 kg.

(2) (a) Substances of 32° shall be packed in sift-proof fibre drums conforming to marginal 3525, or in fibre drums conforming to marginal 3525 with a plastics film inner lining or a plastics internal coating. A package shall not weigh more than 50 kg.

(b) Substances of 32° (b) 2. may also be packed in combination packagings with a fibreboard outer packaging conforming to marginal 3538. The following inner packagings may be used:

plastics boxes, bottles or jars; these inner packagings shall not weigh more than 5 kg and a package shall not weigh more than 40 kg.

an individually packed plastics bag: a package shall not weigh more than 50 kg.

(3) (a) Substances of 33° shall be packed in fibre drums conforming to marginal 3525 with a plastics film inner lining or a plastics internal coating. A package shall not weigh more than 50 kg.

2405 (cont'd)

(b) Substances of 33° (b) 2. may also be packed in combination packagings with a fibreboard outer packaging conforming to marginal 3538. The following inner packagings may be used:

plastics boxes, bottles or jars; these inner packagings shall not weigh more than 5 kg and a package shall not weigh more than 40 kg;

an individually packed plastics bag: a package shall not weigh more than 50 kg.

(c) Substances of 33° (b) 2. may also be packed in sift-proof fibre drums conforming to marginal 3525. A package shall not weigh more than 50 kg.

(d) Substances of 33° (b) 3. may also be packed in removable-head steel drums conforming to marginal 3520 or in removable-head aluminium drums conforming to marginal 3521, with a plastics inner bag. A package shall not weigh more than 55 kg.

(4) Substances of 34° shall be packed:

(a) in sift-proof fibre drums conforming to marginal 3525 or in fibre drums conforming to marginal 3525 with a plastics film lining or a plastics internal coating. A package shall not weigh more than 50 kg; or

(b) in combination packagings with a fibreboard outer packaging conforming to marginal 3538 and an individually packed plastics inner bag. A package shall not weigh more than 50 kg; or

(c) in combination packagings with a fibreboard outer packaging conforming to marginal 3538 and plastics boxes, bottles or jars as inner packagings. An inner packaging shall not weigh more than 5 kg and a package shall not weigh more than 40 kg.

(5) (a) Substances of 35° (b) 1. and 2. shall be packed in fibre drums conforming to marginal 3525 with a plastics film lining or a plastics internal coating. A package shall not weigh more than 50 kg.

(b) Substances of 35° (b) 1. may also be packed in removable-head steel drums conforming to marginal 3520 or removable-head aluminium drums conforming to marginal 3521, in each case with a plastics inner bag. A package shall not weigh more than 55 kg.

(c) The substance of 35° (b) 2. may also be packed in combination packagings with a fibreboard outer packaging conforming to marginal 3538. The following inner packagings may be used:

plastics boxes, bottles or jars; an inner packaging shall not weigh more than 5 kg and a package shall not weigh more than 40 kg;

an individually packed plastics bag: a package shall not weigh more than 50 kg;

2405 (cont'd) (d) The substance of 35° (b) 2. may also be packed in sift-proof fibre drums conforming to marginal 3525. A package shall not weigh more than 50 kg.

(e) The substance of 35° (b) 3. shall be packed in sift-proof fibre drums conforming to marginal 3525. A package shall not weigh more than 25 kg.

(6) The net mass of substances of 36° shall not exceed 10 kg per package. They may only be carried provided that the substances are no more dangerous than those already listed in 31° to 35°. The conditions of carriage and the packagings shall be determined by the competent authority of the country of origin.

If the country of origin is not a party to ADR, the specification shall be validated by the competent authority of the first country party to ADR through which the consignment passes.

(7) The conditions of carriage and packagings for substances of 37° shall be determined by the competent authorities of the country of origin and of the country of destination.

If the country of origin and/or destination is not a party to ADR, the specification shall be validated by the competent authority of the first and/or last country party to ADR through which the consignment passes.

2406 (1) Substances classified under (b) of 1° to 17° shall be packed in:

(a) steel drums conforming to marginal 3520, or

(b) aluminium drums conforming to marginal 3521, or

(c) steel jerricans conforming to marginal 3522, or

(d) plastics drums and jerricans conforming to marginal 3526, or

(e) composite packagings (plastics material) conforming to marginal 3537, or

(f) combination packagings conforming to marginal 3538, or

(g) composite packagings (glass, porcelain, stoneware) conforming to marginal 3539, or

(h) metal IBCs conforming to marginal 3622.

(2) Substances classified under (b) of 1° to 17° with a melting-point above 45°C may also be packed in:

(a) plywood drums conforming to marginal 3523 or fibre drums conforming to marginal 3525, if necessary with one or more sift-proof inner bags, or

(b) boxes conforming to marginal 3532 for steel or aluminium, marginal 3527 for natural wood, marginal 3528 for plywood, marginal 3529 for reconstituted wood, marginal 3530 for fibreboard, or marginal 3531 for plastics, if necessary with one or more sift-proof inner bags, or

2406 (cont'd) (c) sift-proof bags conforming to marginal 3533 for textiles, marginal 3534 for woven plastics, marginal 3535 for plastics film or marginal 3536 for paper, provided that the goods are carried as a full load or the bags are loaded on pallets.

(3) Substances classified under (b) of 1°, 6°, 7°, 8°, 12°, 13°, 16° and 17° may also be packed in:

(a) rigid plastics IBCs conforming to marginal 3624, or

(b) composite IBCs with plastics inner receptacle conforming to marginal 3625, excluding types 11HZ2 and 31HZ2.

(4) Substances classified under (b) of 1°, 6°, 12° and 13° with a melting-point above 45°C may also be packed in:

(a) fibreboard IBCs conforming to marginal 3626, or

(b) wooden IBCs conforming to marginal 3627.

(5) Substances classified under (b) of 1°, 6°, and 12° with a melting-point above 45°C may also be packed in flexible IBCs conforming to marginal 3623, excluding types 13H1, 13L1 and 13M1, provided that the goods are carried as a full load or the flexible IBCs are loaded on pallets.

2407 (1) Substances classified under (c) of 1° to 17° shall be packed in:

(a) steel drums conforming to marginal 3520, or

(b) aluminium drums conforming to marginal 3521, or

(c) steel jerricans conforming to marginal 3522, or

(d) plastics drums and jerricans conforming to marginal 3526, or

(e) composite packagings (plastics material) conforming to marginal 3537, or

(f) combination packagings conforming to marginal 3538, or

(g) composite packagings (glass, porcelain, stoneware) conforming to marginal 3539, or

(h) light-gauge metal packagings conforming to marginal 3540, or

(i) metal IBCs conforming to marginal 3622, or

(j) rigid plastics IBCs conforming to marginal 3624, or

(k) composite IBCs with plastics inner receptacle conforming to marginal 3625, excluding types 11HZ2 and 31HZ2.

(2) Substances classified under (c) of 1° to 17° with a melting-point above 45°C may also be packed in:

(a) plywood drums conforming to marginal 3523 or fibre drums conforming to marginal 3525, if necessary with one or more sift-proof inner bags, or

2407 (cont'd) (b) boxes conforming to marginal 3532 for steel and aluminium, marginal 3527 for natural wood, marginal 3528 for plywood, marginal 3529 for reconstituted wood, marginal 3530 for fibreboard, or marginal 3531 for plastics, if necessary with one or more sift-proof inner bags, or

(c) sift-proof bags conforming to marginal 3533 for textiles, marginal 3534 for woven plastics, marginal 3535 for plastics film or marginal 3536 for paper.

(3) Substances classified under (c) of 6°, 11° to 14°, 16° and 17° with a melting-point above 45°C may also be packed in:

(a) flexible IBCs conforming to marginal 3623, excluding types 13H1, 13L1 and 13M1, or

(b) fibreboard IBCs conforming to marginal 3626, or

(c) wooden IBCs conforming to marginal 3627 or

(d) composite IBCs with plastics inner receptacle of type 11HZ2 conforming to marginal 3625.

2408 Celluloid in sheets of 3° (c) may also be carried unpackaged on pallets, wrapped in plastics film and secured by appropriate means, such as steelbands, as a full load in closed vehicles. A pallet shall not weigh more than 1,000 kg.

2409-2410

3. Mixed packing

2411 (1) Substances which come under the same item may be packed together in a combination packaging conforming to marginal 3538.

(2) Substances of 21° to 26° and 31° to 37° shall not be packed with other goods.

(3) Except for the substances mentioned in paragraph (2) and unless special conditions to the contrary are prescribed under paragraph (7), substances of Class 4.1 in quantities not exceeding 5 kg per receptacle may be packed together in a combination packaging conforming to marginal 3538 with substances or articles of other classes - provided that mixed packing is also permitted for substances and articles of these classes - and/or with goods not subject to the provisions of ADR, provided they do not react dangerously with one another.

(4) The following shall be 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.

2411
(cont'd)

(5) The provisions of marginals 2001 (7), 2002 (6) and (7) and 2402 shall be observed.

(6) Where a wooden or fibreboard box is used, a package shall not weigh more than 100 kg.

(7) Substances classified under (b) or (c) of 1° to 5° and 11° to 14° shall not be packed together with substances of Class 5.1 classified under (a) or (b) of the various items of marginal 2501.

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

Danger labels

2412 (1) Packages containing substances of Class 4.1 shall bear a label conforming to model No. 4.1.

(2) Packages containing substances of 7°, 16°, 22° or 25° shall, in addition, bear a label conforming to model No. 6.1 and packages containing substances of 8° and 17° a label conforming to model No. 8.

(3) Packages containing fragile receptacles not visible from the outside shall bear on two opposite sides a label conforming to model No. 12.

2413

B. Particulars in the transport document

2414 The description of the goods in the transport document shall conform to one of the identification numbers and names underlined in marginal 2401.

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 identification number and the n.o.s. designation, followed by the chemical or technical name of substance 1/.

The description of the goods shall be followed by particulars of the class, the item number, the letter, if any, and the initials "ADR" (or "RID"), e.g. "4.1, 6°(b), ADR".

For the carriage of wastes (see marginal 2000 (4)) the description of the goods shall be: "Waste containing ...", the component(s) used for the classification of the waste under marginal 2002 (8) to be entered under its/their chemical name(s), e.g. "Waste, earth containing toluene 4.1, 4° (c), ADR".

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.

2414 (cont'd) For the carriage of solutions and mixtures (such as preparations and wastes) containing several components subject to the provisions of ADR, it will not in general be necessary to refer to more than two components which most predominantly contribute to the danger or dangers of the solutions and mixtures.

If a named substance in accordance with marginal 2400 (9) is not subject to the conditions of this Class, the consignor may enter in the transport document: "Not goods of Class 4.1."

2415-2421

C. Empty packagings

2422 (1) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), except those referred to in paragraph (2), uncleaned, of 41°, shall be closed in the same way and present the same degree of leakproofness as if they were full.

(2) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), of 41°, to the outside of which residues of their previous contents have adhered, shall be carried in leakproof packagings.

(3) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), which have contained water-wetted substances of 13° (b) or substances of 21° to 25° shall not be accepted for carriage unless the residues are so packed that the content of water or other phlegmatizers added to the substances to render them inert cannot diminish.

Uncleaned empty packagings which have contained substances of 31° to 37° shall not be accepted for carriage unless steps have been taken to prevent dangerous decomposition.

(4) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), of 41°, and packagings conforming to (2) shall bear the same danger labels as if they were full.

(5) The description of the goods in the transport document shall conform to one ofthe names underlined in 41°, e.g. "Empty packaging, 4.1, 41°, ADR". In the case of uncleaned empty tank-vehicles, empty demountable tanks, empty tank-containers and empty small containers, the description shall be completed by adding the words "Last load" together with the name and item number of the goods last loaded, e.g. "Last load: 2304 naphtalene, molten, 5°".

2423-2424

D. Transitional measures

2425 Substances and articles of Class 4.1 may be carried until 30 June 1993 in accordance with the provisions of Class 4.1 applicable until 31 December 1992. The transport document shall, in such cases, bear the inscription: "Carriage in accordance with the ADR in force before 1 January 1993.

2426-
2429

CLASS 4.2. SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION

1. List of substances

2430 (1) Among the substances and articles covered by the title of Class 4.2, those which are listed in marginal 2431 or are covered by a collective heading in that marginal are subject to the conditions set out in marginals 2430 (2) to 2452 and to the provisions of this Annex and of Annex B. They are then considered as substances and articles of ADR.

(2) The title of Class 4.2 covers:

- substances, including mixtures and solutions (liquids or solids), which even in small quantities ignite on contact with air within five minutes. They are described as substances liable to spontaneous combustion (pyrophoric substances);

- substances and articles, including mixtures and solutions, which, on contact with air, are liable to heat up without any energy input. These substances can ignite only in large quantities (kilograms) and after a long period of time (hours or days). They are described as self-heating substances.

(3) The substances and articles of Class 4.2 are subdivided as follows:

A. Organic substances liable to spontaneous combustion.

B. Inorganic substances liable to spontaneous combustion.

C. Organometallic compounds liable to spontaneous combustion.

D. Empty packagings.

Substances and articles of Class 4.2 classified under the various items of marginal 2431, shall be assigned to one of the following groups designated by letters (a), (b) or (c), according to their degree of danger:

(a) liable to spontaneous combustion (pyrophoric),

(b) self-heating,

(c) slightly self-heating.

(4) The assignment of substances and articles not specifically named to 3° to 5°, 12°, 15°, 16°, 31° and 32° of marginal 2431, as well as within these items to the letters, can be based on experience or the results of the test procedure in accordance with Appendix A.3, marginals 3330 to 3333. Assignment to 6° to 10°, 14°, 17° to 21° and 33°, as well as within these to the letters, shall be based on the results of the test procedure in accordance with Appendix A.3, marginals 3330 to 3333; experience shall also be taken into account when it leads to a more strictly based assignment.

2430 (5) (cont'd) When substances or articles not specifically named are assigned to the items of marginal 2431 on the basis of test procedures in accordance with Appendix A.3, marginals 3330 to 3333, the following criteria apply:

(a) Solids liable to spontaneous combustion (pyrophoric) shall be assigned to Class 4.2 when they ignite on falling from a height of 1 m or within five minutes;

(b) Liquids liable to spontaneous combustion (pyrophoric) shall be assigned to Class 4.2 when:

(i) on being poured on an inert carrier, they ignite within five minutes, or

(ii) in the event of a negative result of the test according to (i), when poured on a dry, indented filter paper (Whatman No. 3 filter), they ignite or carbonize it within five minutes;

(c) Substances in which, in a 10 cm sample cube, at 140° C test temperature, spontaneous combustion or a rise in temperature to over 200° C is observed within 24 hours shall be assigned to Class 4.2. This criterion is based on the temperature of the spontaneous combustion of charcoal, which is at 50° C for a sample cube of 27 m^3. Substances with a temperature of spontaneous combustion higher than 50° C for a volume of 27 m^3 are not to be assigned to Class 4.2.

(6) When substances and articles not specifically named are assigned to the letters of the items of marginal 2431 on the basis of test procedures in accordance with Appendix A.3, marginals 3330 to 3333, the following criteria shall apply:

(a) Substances liable to spontaneous combustion (pyrophoric) shall be assigned to letter (a);

(b) Self-heating substances and articles in which, in a 2.5 cm sample cube, at 140° C test temperature, spontaneous combustion or a rise in temperature to over 200° C is observed within 24 hours, shall be assigned to letter (b);

(c) Slightly self-heating substances in which, in a 2.5 cm sample cube, the phenomena referred to under (b) are not observed, in the given conditions, but in which in a 10 cm sample cube at 140° C test temperature spontaneous combustion or a rise in temperature to over 200° C is observed within 24 hours, shall be assigned to letter (c).

(7) If substances of Class 4.2, as a result of admixtures, come into different categories of risk from those to which the substances of marginal 2431 belong, these mixtures shall be assigned to the items and letters to which they belong on the basis of their actual degree of danger.

NOTE: For the classification of solutions and mixtures (such as preparations and wastes), see also marginal 2002 (8).

2430
(cont'd)

(8) When substances are specifically named under more than one letter of the same item in marginal 2431, the relevant letter may be determined on the basis of the results of the test procedure in accordance with Appendix A.3, marginals 3330 to 3333, and the criteria set out in (6).

(9) On the basis of the test procedure in accordance with Appendix A.3, marginals 3330 to 3333, and the criteria set out in (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 2444).

(10) Substances and mixtures of substances having a melting point higher than 45° C shall be considered to be solids as defined in the packaging requirements of marginals 2435 (2), 2436 (2) and 2437 (3) and (4).

2430 (11) Self-heating solids, oxidizing, assigned to identification number 3127 of the United Nations Recommendations shall not be accepted for carriage (see, however, marginal 2002(8), footnote[1/] to the table in paragraph 2.3.1).

2431 A. Organic substances liable to spontaneous combustion

1° Carbon, powdered, in grains or in pieces

(b) 1361 carbon or 1361 carbon black, animal or vegetable origin

(c) 1361 carbon or 1361 carbon black, animal or vegetable origin, 1362 carbon, activated.

NOTE 1: Carbons made by a steam activation process and non-activated carbon black of mineral origin are not subject to the provisions of ADR.

NOTE 2: Non-activated carbons of mineral origin and carbon dust in a state not liable to self-heating are not subject to the provisions of ADR.

2° Animal and vegetable substances:

(b) 1374 fishmeal,(fish scrap), unstabilized;

(c) 1363 copra, 1386 seedcake containing more than 1.5% (mass) oil and with not more than 11% (mass) moisture, 2217 seedcake containing not more than 1.5% (mass) oil and having not more than 11% (mass) moisture.

3° Industrially-produced fibres, fabrics and similar products:

(c) 1364 cotton waste, oily, 1365 cotton, wet, 1379 paper, unsaturated oil treated, incompletely dried (including carbon paper),
1373 fibres, animal or vegetable or synthetic, n.o.s. impregnated with oil, or 1373 fabrics, animal or vegetable or synthetic, n.o.s. impregnated with oil.

2431
(cont'd)

4° Substances made from weakly nitrated cellulose:

(c) 2002 celluloid, scrap,

2006 plastics, nitrocellulose-based, self-heating, n.o.s.

NOTE: 1353 fibres or fabrics impregnated with weakly nitrated cellulose, non-self heating, and 2000 celluloid are articles of Class 4.1 (see marginal 2401, 3°(c)).

5° Solid organic spontaneously combustible non-toxic and non-corrosive substances, and mixtures of solid organic spontaneously combustible non-toxic and non-corrosive substances (such as preparations and wastes), which cannot be classified under other collective headings:

(a) 2846 pyrophoric solid, organic, n.o.s.;

(b) 1369 p-nitrosodimethylaniline, 2940 9-phosphabicyclononanes (cyclooctadiene phosphines), 3088 self-heating solid, organic, n.o.s.;

(c) 3088 self-heating solid, organic, n.o.s.

6° Liquid organic spontaneously combustible non-toxic and non-corrosive substances, and solutions of organic spontaneously combustible non-toxic and non-corrosive substances (such as preparations and wastes), which cannot be classified under other collective headings:

(a) 2845 pyrophoric liquid, organic, n.o.s.;

NOTE: Special packing conditions are applicable to this substance (see marginal 2433).

(b) 3183 self-heating liquid, organic, n.o.s.;

(c) 3183 self-heating liquid, organic, n.o.s.

7° Solid organic spontaneously combustible toxic substances, and mixtures of solid organic spontaneously combustible toxic substances (such as preparations and wastes), which cannot be classified under other collective headings:

(b) 3128 self-heating solid, organic, toxic, n.o.s.;

(c) 3128 self-heating solid, organic, toxic, n.o.s.

NOTE: For toxicity criteria, see footnote 1/ to marginal 2600 (1).

8° Liquid organic spontaneously combustible toxic substances, and solutions of organic spontaneously combustible toxic substances (such as preparations and wastes), which cannot be classified under other collective headings:

2431 (cont'd)

(b) 3184 self-heating liquid, organic, toxic, n.o.s.;

(c) 3184 self-heating liquid, organic, toxic, n.o.s.

NOTE: For toxicity criteria, see footnote 1/ to marginal 2600 (1).

9° Organic spontaneously combustible corrosive solids, and mixtures of organic spontaneously combustible corrosive solids (such as preparations and wastes), which cannot be classified under other collective headings:

(b) 3126 self-heating solid, organic, corrosive, n.o.s.;

(c) 3126 self-heating solid, organic, corrosive, n.o.s.

NOTE: For corrosivity criteria, see footnote 1/ to marginal 2800 (1).

10° Organic spontaneously combustible corrosive liquids, and solutions of organic spontaneously combustible corrosive substances (such as preparations and wastes), which cannot be classified under other collective headings:

(b) 3185 self-heating liquid, organic, corrosive, n.o.s.;

(c) 3185 self-heating liquid, organic, corrosive, n.o.s.

NOTE: For corrosivity criteria, see footnote 1/ to marginal 2800 (1).

B. Inorganic substances liable to spontaneous combustion

11° Phosphorus

(a) 1381 phosphorus, white or yellow, dry or 1381 phosphorus, white or yellow, under water or 1381 phosphorus, white or yellow, in solution.

NOTE: 2447 phosphorus, white or yellow, molten is a substance of 22°.

12° Metals and metal alloys in powder, dust or granular form or in another spontaneously combustible form:

(a) 1854 barium alloys, pyrophoric, 1855 calcium, pyrophoric or 1855 calcium alloys, pyrophoric, 2008 zirconium powder, dry, 2545 hafnium powder, dry, 2546 titanium powder, dry, 2881 metal catalyst, dry, 1383 pyrophoric metals, n.o.s. or 1383 pyrophoric alloys, n.o.s.;

(b) 1378 metal catalyst, wetted with a visible excess of liquid, 2008 zirconium powder, dry, 2545 hafnium powder, dry, 2546 titanium powder, dry, 2881 metal catalyst, dry, 3189 self-heating metal powders, n.o.s.;

2431 (cont'd)

NOTE to (a) and (b): The identification numbers 1378 and 2881 include only metal catalysers with a base of nickel, cobalt, copper, manganese or their compounds.

(c) 1932 zirconium scrap, 2008 zirconium powder, dry, 2009 zirconium, dry, finished sheets, strip or coiled wire (less than 18 um thick), 2545 hafnium powder, dry, 2546 titanium powder, dry, 2793 ferrous metal borings, shavings, turnings or cuttings in a self-heating form, 2881 metal catalyst, dry, 3189 self-heating metal powders, n.o.s.

NOTE 1: 2858 finished zirconium products of a thickness of 18 um or more are substances of Class 4.1 (see marginal 2401, 13°(c)).

NOTE 2: 1326 hafnium powders, 1352 titanium powders or 1358 zirconium powders, wetted, with not less than 25% water, are substances of Class 4.1 (see marginal 2401, 13°).

NOTE 3: Dust and powder of metals in non-spontaneously combustible form, which nevertheless, in contact with water, emit flammable gases, are substances of Class 4.3 (see marginal 2471, 13°).

13° Sulphides, hydrosulphides and dithionites in spontaneously combustible form:

(b) 1382 potassium sulphide, anhydrous or 1382 potassium sulphide with less than 30% water of crystallization, 1384 sodium dithionite (sodium hydrosulphite), 1385 sodium sulphide, anhydrous or 1385 sodium sulphide with less than 30% water of crystallization, 1923 calcium dithionite (calcium hydrosulphite), 1929 potassium dithionite (potassium hydrosulphite), 2318 sodium hydrosulphide with less than 25% water of crystallization;

NOTE: Potassium sulphide and sodium sulphide with not less than 30% water of crystallization and sodium hydrosulphide with not less than 25% water of crystallization are substances of Class 8 (see marginal 2801, 45° (b));

(c) 3174 titanium disulphide

14° Metallic salts and alcoholates, non-toxic and non-corrosive, in spontaneously combustible form:

(b) 3205 alkaline earth metal alcoholates, n.o.s.;

(c) 3205 alkaline earth metal alcoholates, n.o.s.

15° Metallic salts and alcoholates, corrosive, in spontaneously combustible form:

(a) 2441 titanium trichloride, pyrophoric or 2441 titanium trichloride mixtures, pyrophoric;

2431 (cont'd)

(b) 1431 sodium methylate,
3206 alkali metal alcoholates, n.o.s.;

(c) 3206 alkali metal alcoholates, n.o.s.

NOTE: Titanium trichloride or titanium trichloride mixtures, not spontaneously combustible, are substances of Class 8 (see marginal 2801, 22° (b)).

16° Spontaneously combustible, non-toxic and non-corrosive inorganic solids and mixtures of spontaneously combustible non-toxic and non-corrosive inorganic solids (such as preparations and wastes), which cannot be classified under other collective headings:

(a) 3200 pyrophoric solid, inorganic, n.o.s.;

(b) 2004 magnesium diamide,
3190 self-heating solid, inorganic, n.o.s.;

(c) 1376 iron oxide, spent, or 1376 iron sponge, spent, obtained from coal gas purification, 2210 maneb (manganese ethylene 1,2-bis (dithiocarbamate)) or 2210 maneb preparations with not less than 60% maneb,
3190 self-heating solid, inorganic, n.o.s.

NOTE: 2968 maneb or 2968 maneb preparations which are stabilized against self-heating and which, on contact with water, emit flammable gases, are substances of Class 4.3 (see marginal 2471, 20° (c)).

17° Inorganic spontaneously combustible, non-toxic and non-corrosive liquids, and solutions of spontaneously combustible inorganic non-toxic and non-corrosive substances (such as preparations and wastes), which cannot be classified under other collective headings:

(a) 2870 aluminium borohydride or 2870 aluminium borohydride contained in devices,
3194 pyrophoric liquid, inorganic, n.o.s.;

NOTE 1: Special packing conditions are applicable to these substances (see marginal 2433).

NOTE 2: Other metal hydrides in flammable form are substances of Class 4.1 (see marginal 2401, 14°).

NOTE 3: Metal hydrides which, in contact with water, emit flammable gases, are substances of Class 4.3 (see marginal 2471, 16°).

(b) 3186 self-heating liquid, inorganic, n.o.s.;

(c) 3186 self-heating liquid, inorganic, n.o.s.

2431
(cont'd)

18° Inorganic spontaneously combustible toxic solids and mixtures of inorganic spontaneously combustible toxic solids (such as preparations and wastes), which cannot be classified under other collective headings:

(b) 3191 self-heating solid, inorganic, toxic, n.o.s.;

(c) 3191 self-heating solid, inorganic, toxic, n.o.s.

NOTE: For toxicity criteria, see footnote 1/ to marginal 2600 (1).

19° Inorganic spontaneously combustible toxic liquids and solutions of inorganic spontaneously combustible toxic substances (such as preparations and wastes), which cannot be classified under other collective headings:

(a) 1380 pentaborane;

NOTE: Special packing conditions are applicable to this substance (see marginal 2433).

(b) 3187 self-heating liquid, inorganic, toxic, n.o.s.;

(c) 3187 self-heating liquid, inorganic, toxic, n.o.s.

NOTE: For toxicity criteria, see footnote 1/ to marginal 2600 (1).

20° Inorganic spontaneously combustible corrosive solids and mixtures of inorganic spontaneously combustible corrosive solids (such as preparations and wastes), which cannot be classified under other collective headings:

(b) 3192 self-heating solid, inorganic, corrosive, n.o.s.;

(c) 3192 self-heating solid, inorganic, corrosive, n.o.s.

NOTE: For the corrosivity criteria, see footnote 1/ to marginal 2800 (1).

21° Inorganic spontaneously combustible corrosive liquids and solutions of inorganic spontaneously combustible corrosive substances (such as preparations and wastes), which cannot be classified under other collective headings:

(b) 3188 self-heating liquid, inorganic, corrosive, n.o.s.;

(c) 3188 self-heating liquid, inorganic, corrosive, n.o.s.

NOTE 1: For the corrosivity criteria, see footnote 1/ to marginal 2800 (1).

2431
(cont'd)

22° 2447 phosphorus, white or yellow molten.

C. Organometallic compounds liable to spontaneous combustion

NOTE 1: Organometallic compounds and their solutions which are not liable to spontaneous combustion but, in contact with water, emit flammable gases, are substances of Class 4.3 (see marginal 2471, 3°).

NOTE 2: Flammable solutions with organometallic compounds which are not liable to spontaneous combustion and, in contact with water, do not emit flammable gases, are substances of Class 3.

NOTE 3: Special packing conditions are applicable to the substances of 31° to 33° (see marginal 2433).

31° Spontaneously combustible metal alkyls and metal aryls

(a) 1366 diethylzinc, 1370 dimethylzinc, 2005 magnesium diphenyl, 2445 lithium alkyls, 3051 aluminium alkyls, 3053 magnesium alkyls,
2003 metal alkyls, n.o.s. or 2003 metal aryls, n.o.s.,

32° Other spontaneously combustible organometallic compounds

(a) 3052 aluminium alkyl halides, 3076 aluminium alkyl hydrides, 3049 metal alkyl halides, n.o.s or 3049 metal aryl halides, n.o.s., 3050 metal alkyl hydrides, n.o.s or 3050 metal aryl hydrides, n.o.s.

33° Spontaneously combustible organometallic compounds

(a) 3203 pyrophoric organometallic compounds, n.o.s.

D. Empty packagings

41° Empty packagings, including empty intermediate bulk containers (IBCs), empty tank-vehicles, empty demountable tanks, empty vehicles and empty tank-containers, uncleaned, as well as empty vehicles for carriage in bulk and empty small bulk containers, uncleaned, which have contained substances of Class 4.2.

NOTE: Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), empty tank-vehicles, empty demountable tanks, empty tank-containers and empty small containers which have contained substances of 4° (c), identification No. 2002, of 12° (c), identification Nos. 1932, 2009 and 2793, and of 16° (c), identification No. 1376, are not subject to the provisions of ADR.

2. Provisions

A. Packages

1. General conditions of packing

2432 (1) Packagings shall satisfy the conditions of Appendix A.5, unless special conditions for the packing of certain substances are prescribed in marginal 2433.

Intermediate bulk containers (IBCs) shall satisfy the conditions of Appendix A.6.

(2) With the exception of the packagings referred to in marginal 2436 (2) (a) and (b) and (3) and in marginal 2437 (3) (a) and (b), (4) and (5), (inner) packagings shall be hermetically closed.

(3) In accordance with the provisions of marginals 2430 (3) and 3511 (2) or 3611 (2) respectively, the following shall be used:

packagings of packing group I, marked with the letter "X", for substances liable to spontaneous combustion (pyrophoric) classified under (a) of each item,

packagings of packing group II or I, marked with the letter "Y" or "X", or IBCs of packing group II, marked with the letter "Y", for self-heating substances classified under (b) of each item,

packagings of packing groups III, II or I, marked with the letter "Z", "Y" or "X", or IBCs of packing groups III or II, marked with the letter "Z" or "Y", for self-heating substances classified under (c) of each item.

NOTE: For the carriage of substances of Class 4.2 in tank-vehicles, demountable tanks and tank-containers, as well as for carriage in bulk, see Annex B.

2. Packing of individual substances

2433 (1) Pyrophoric liquids of 6° (a), 17° (a) with the exception of aluminium borohydride in devices, 19° (a) and 31° to 33°, shall be packed in hermetically closing metal receptacles which are not affected by the contents and have a capacity of not more than 450 litres. The receptacles shall be subjected to the initial test and periodic tests every five years at a pressure of not less than 1MPa (10 bar) (gauge pressure). The receptacles shall not be filled to more than 90% of their capacity; however, a space of at least 5% shall remain empty for safety when the liquid is at an average temperature of 50° C. During carriage, the liquid shall be under a layer of inert gas the gauge pressure of which shall be not less than 50 kPa (0.5 bar). The receptacles shall carry a data plate with the following particulars entered in a durable form:

2433 (cont'd)
- substance or substances 1/ accepted for carriage;
- tare 2/ of the receptacle, including accessories;
- test pressure 2/ (gauge pressure);
- date (month, year) of the last test undergone;
- stamp of the expert who carried out the test;
- capacity 2/ of the receptacle;
- maximum mass of filling allowed 2/.

(2) These substances may also be packed in combination packagings conforming to marginal 3538 with a glass inner packaging and a steel or aluminium outer packaging conforming to marginal 3532. Receptacles shall not be filled to more than 90% of their capacity. A package shall contain only a single inner packaging. 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.

2434 Phosphorus of 22° shall be carried only in tank-vehicles and demountable tanks (see Appendix B.1a) or in tank-containers (see Appendix B.1b).

2435 (1) Substances classified under (a) of 5°, 12°, 15° and 16° shall be packed in:

(a) non-removable head steel drums conforming to marginal 3520, or

(b) non-removable head aluminium drums conforming to marginal 3521, or

(c) non-removable head steel jerricans conforming to marginal 3522, or

(d) non-removable head plastics drums with a maximum capacity of 60 litres and in non-removable head plastics jerricans conforming to marginal 3526, or

(e) composite packagings (plastics material) conforming to marginal 3537, or

(f) combination packagings with glass, plastics material or metal inner packagings conforming to marginal 3538.

1/ The name may be replaced by a generic description covering substances of a similar nature and also compatible with the characteristics of the receptacle.

2/ The units of measurement to be added each time after the numerical values.

2435 (2) (cont'd) Solids as defined in marginal 2430 (10) may also be packed: in removable head drums conforming to marginal 3520 for steel, marginal 3521 for aluminium, or marginal 3526 for plastics material, or in removable head jerricans conforming to marginal 3522 for steel or marginal 3526 for plastics material.

(3) White or yellow phosphorus of 11° (a) shall be packed in:

(a) non-removable head steel drums conforming to marginal 3520;

(b) non-removable head steel jerricans conforming to marginal 3522;

(c) combination packagings conforming to marginal 3538 with metal inner packagings.

(4) Aluminium borohydride contained in devices of 17° (a) shall be packed in:

(a) removable-head steel drums conforming to marginal 3520, or

(b) removable-head aluminium drums conforming to marginal 3521, or

(c) removable-head plastics drums conforming to marginal 3526, or

(d) steel or aluminium boxes conforming to marginal 3532.

2436 (1) Substances classified under (b) of the various items shall be packed in:

(a) steel drums conforming to marginal 3520, or

(b) aluminium drums conforming to marginal 3521, or

(c) steel jerricans conforming to marginal 3522, or

(d) plastics drums and jerricans conforming to marginal 3526, or

(e) composite packagings (plastics material) conforming to marginal 3537, or

(f) combination packagings conforming to marginal 3538, or

(g) composite packagings (glass, porcelain, stoneware) conforming to marginal 3539, or

(h) metal IBCs conforming to marginal 3622, or

(i) rigid plastics IBCs conforming to marginal 3624, or

(j) composite IBCs with plastics inner receptacle conforming to marginal 3625, with the exception of types 11HZ2 and 31HZ2.

(2) Solids as defined in marginal 2430 (10) may also be packed in:

(a) plywood drums conforming to marginal 3523 or in fibre drums conforming to marginal 3525, if necessary with one or more siftproof inner bags, or

(b) plastics film bags conforming to marginal 3535, provided that they make up a full load or are loaded on pallets.

2436 (3) (cont'd) Fishmeal of 2° (b) may also be packed in flexible IBCs conforming to marginal 3623, with the exception of types 13H1, 13L1 and 13M1, provided that they make up a full load or the flexible IBCs are loaded on pallets.

2437 (1) Substances classified under (c) of the various items shall be packed in:

(a) steel drums conforming to marginal 3520, or

(b) aluminium drums conforming to marginal 3521, or

(c) steel jerricans conforming to marginal 3522, or

(d) plastics drums and jerricans conforming to marginal 3526, or

(e) composite packagings (plastics material) conforming to marginal 3537, or

(f) combination packagings conforming to marginal 3538, or

(g) composite packagings (glass, porcelain or stoneware) conforming to marginal 3539, or

(h) light-gauge metal packagings conforming to marginal 3540.

NOTE: Metal packagings for substances of 4° shall be so constructed and closed as to yield when the internal pressure reaches a value not greater than 300 kPa (3 bar).

(2) With the exception of substances of 4°, substances may also be packed in:

(a) metal IBCs conforming to marginal 3622, or

(b) rigid plastics IBCs conforming to marginal 3624, or

(c) composite IBCs with plastics inner receptacle conforming to marginal 3625 with the exception of types 11HZ2 and 31HZ2.

(3) Solids as defined in marginal 2430 (10) may also be packed in:

(a) plywood drums conforming to marginal 3523, or in fibre drums conforming to marginal 3525, if necessary with one or more siftproof inner bags, or

(b) plastics film bags conforming to marginal 3535.

(4) With the exception of substances of 4°, solids as defined in marginal 2430 may also be packed in flexible IBCs conforming to marginal 3623, with the exception of types 13H1, 13L1 and 13M1.

(5) Substances of 2° (c) and 3° (c) may also be packed in untested packagings, which need only meet the provisions of marginal 3500 (1), (2) and (4) to (7). Cotton waste with an oil content less than 5% (mass) and cotton of 3° (c) may also be carried in firmly secured balls.

2438 (1) The openings of receptacles for the carriage of liquids having a viscosity, at 23° C, of less than 200 mm^2/s, with the exception of glass ampoules and pressure cylinders, shall be hermetically sealed by means of two devices in series, one of which shall be screwed shut or secured in an equivalent manner.

NOTE: For IBCs, however, see marginal 3621 (8).

(2) Steel drums conforming to marginal 3520 containing wetted metal catalyst of 12°(b) shall be fitted with a vent in accordance with marginal 3500 (8).

2439-
2440

3. Mixed packing

2441 (1) Substances classified under the same item may be packed together in a combination packaging conforming to marginal 3538.

(2) Substances of 6° (a), 11°, 17° (a), 19° (a), and 31° to 33° shall not be packed together with substances or articles of other items of Class 4.2, with substances or articles of other classes or with goods which are not subject to the provisions of ADR.

(3) With the exception of the substances referred to in (2) above, substances of Class 4.2, in quantities not exceeding 3 litres for liquids and/or 6 kg for solids, per receptacle, may be packed together in a combination packaging conforming to marginal 3538, with substances or articles of other classes - provided that mixed packing is also permitted for substances and articles of those classes - and/or with goods which are not subject to the provisions of ADR, provided they do not react dangerously with one another.

For substances classified in group (a), the net quantity per package shall not exceed 3 kg for solids/3 litres for liquids.

(4) The following shall be 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 provisions of marginals 2001(7), 2002 (6) and (7) and 2432 shall be observed.

(6) A package shall not weigh more than 100 kg when wooden or fibreboard cases are used.

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

Danger labels

2442 (1) Packages containing substances of Class 4.2 shall bear a label conforming to model No. 4.2.

(2) Packages containing substances of 17° (a), maneb or maneb preparations of 16° (c), and substances of 31° to 33° shall in addition bear a label conforming to model No. 4.3.

(3) Packages containing substances of 7°, 8°, 11°, 18° and 19° shall in addition bear a label conforming to model No. 6.1.

(4) Packages containing substances of 9°, 10°, 15°, 20° and 21° shall in addition bear a label conforming to model No. 8.

(5) Packages containing fragile receptacles not visible from the outside shall bear on two opposite sides a label conforming to model No. 12.

(6) Packages containing liquids, the closures of which are not visible from the outside, packages containing receptacles fitted with vents or receptacles fitted with vents without outer packaging and packages containing phosphorus covered with water of 11° (a) shall bear on two opposite sides a label conforming to model No. 11.

2443

B. Particulars in the transport document

2444 The description of the goods in the transport document shall conform to one of the identification numbers and names underlined in marginal 2431. 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 identification number and the n.o.s designation, followed by the chemical or technical name of substance[1/].

The description of the goods shall be followed by particulars of the class, the item number, the letter and the initials "ADR" (or "RID"), e.g. "4.2. 13° (b), ADR".

For the carriage of wastes (see marginal 2000 (4)) the description of the goods shall be: "Waste containing ...", the component(s) used for the classification of the waste under marginal 2002 (8) to be entered under its/their chemical name(s), e.g. "Waste earth containing 1381 white phosphorus under water 4.2, 11° (a) ADR".

For the carriage of solutions and mixtures (such as preparations and wastes) containing several components subject to the provisions of ADR, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures.

If a named substance in accordance with marginal 2430 (9) is not subject to the conditions of this Class, the consignor may enter in the transport document: "Not goods of Class 4.2".

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.

2445-
2451

C. Empty packagings

2452 (1) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs) of 41° shall be closed in the same manner and be leakproof to the same degree as if they were full.

(2) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs) of 41° shall bear the same danger labels as if they were full.

(3) The description of the goods in the transport document shall conform to one of the names underlined in 41°, e.g. "Empty packaging, 4.2, 41°, ADR". In the case of empty tank-vehicles, empty demountable tanks, empty tank-containers or empty small containers, uncleaned, this description shall be accompanied by the words "Last load" and the name and item number of the goods last loaded e.g. "Last load: 1381 white phosphorus, dry, 11° (a)".

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D. Transitional measures

2455 Substances and articles of Class 4.2 may be carried until 30 June 1993 in accordance with the provisions of Class 4.2 applicable until 31 December 1992. The transport document shall, in such cases, bear the inscription: "Carriage in accordance with the ADR in force before 1 January 1993".

2456-
2469

CLASS 4.3. SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

1. List of substances

2470 (1) Among the substances covered by the title of Class 4.3, those which are listed in marginal 2471 or covered by a collective heading of that marginal are subject to the conditions set out in marginals 2470 (2) to 2492 and to the provisions of this Annex and of Annex B. They are then considered as substances of ADR.

NOTE: For the quantities of substances listed in marginal 2471 which are not subject to the provisions for this Class, either in this Annex or in Annex B, see marginal 2471a.

(2) The title of Class 4.3 covers substances which react with water to emit flammable gases liable to form explosive mixtures with air.

NOTE: The term "water-reactive" used in the n.o.s. entries of marginal 2471 denotes a substance which in contact with water emits flammable gases.

(3) Substances of Class 4.3 are subdivided as follows:

A. Organic substances, organometallic compounds and substances in organic solvents, which, in contact with water, emit flammable gases;

B. Inorganic substances which, in contact with water, emit flammable gases;

C. Empty packagings.

Substances of Class 4.3 classified under the various items of marginal 2471 shall be assigned to one of the following groups, designated by the letter (a), (b) or (c), according to their degree of danger:

(a) very dangerous,

(b) dangerous,

(c) less dangerous.

(4) Assignment of substances not mentioned by name to marginal 2471, 1°, 3°, 11°, 13°, 14°, 16° and 20° to 25°, and within these items to the letters, shall be based on the results of the test procedure in accordance with Appendix A.3, marginals 3340 and 3341; experience shall also be taken into account when it leads to a more strictly based assignment.

(5) When substances not specifically named are assigned to the items of marginal 2471 on the basis of the test procedure in accordance with Appendix A.3, marginals 3340 and 3341, the following criteria apply:

2470 (cont'd) A substance shall be assigned to Class 4.3 if:

(a) during any stage of the test the gas emitted ignites spontaneously, or

(b) the rate of emission of flammable gas per hour is equal to or greater than 1 litre per kilogram per hour of the substance to be tested.

(6) When substances not specifically named are assigned to the letters of the items in marginal 2471 on the basis of the test procedure in accordance with Appendix A.3, marginals 3340 and 3341, the following criteria shall apply:

(a) Any substance which reacts vigorously with water at ambient temperature to produce gas which ignites spontaneously, or one which reacts readily with water at ambient temperatures such that the rate of emission of flammable gas within one minute is equal to or greater than 10 litres per kilogram of substance, shall be assigned to letter (a);

(b) Any substance which reacts readily with water at ambient temperature such that the maximum rate of emission of flammable gas per hour is equal to or greater than 20 litres per kilogram of substance , and which does not meet the criteria of letter (a), shall be assigned to letter (b);

(c) Any substance which reacts slowly with water at ambient temperature such that the maximum rate of emission of flammable gas per hour is equal to or greater than 1 litre per kilogram of substance , and which does not meet the criteria of letters (a) or (b), shall be assigned to letter (c).

(7) If substances of Class 4.3, as a result of admixtures, come into different categories of risk from those to which the substances of marginal 2471 belong, these mixtures shall be assigned to the items and letters to which they belong on the basis of their actual degree of danger.

NOTE: For the classification of solutions and mixtures (such as preparations and wastes) see also marginal 2002 (8).

(8) When substances are specifically named under more than one letter of the same item of marginal 2471, the relevant letter may be determined on the basis of the results of the test procedure in accordance with Appendix A.3, marginals 3340 and 3341, and the criteria set out in paragraph (6).

(9) On the basis of the test procedure in accordance with Appendix A.3, marginals 3340 and 3341, and the criteria set out in paragraph (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 2484).

2470 (cont'd) (10) Substances and mixtures of substances having a melting point higher than 45° C shall be considered as solids for the purposes of the conditions of packing in marginals 2474 (2), 2475 (3) and 2476 (2).

(11) Water-reactive solids, flammable, assigned to identification number 3132, water reactive solids, oxidizing, assigned to identification number 3133 and water reactive solids, self heating, assigned to identification number 3135 of the United Nations Recommendations shall not be accepted for carriage (see, however, marginal 2002 (8), footnote 1/ in the table in paragraph 2.3.1).

2471 A. Organic substances, organometallic compounds and substances in organic solvents which, in contact with water, emit flammable gases

1° Chlorosilanes:

(a) 1183 ethyldichlorosilane, 1242 methyldichlorosilane, 1295 trichlorosilane, 2988 chlorosilanes, n.o.s.

NOTE 1: Special packing conditions are applicable to these substances (see marginal 2473(1)).

NOTE 2: Chlorosilanes having a flash point of less than 21° C and which, in contact with water, do not emit flammable gases are substances of Class 3 (see marginal 2301, 21°(a)).

NOTE 3: Chlorosilanes having a flash point equal to or greater than 21° C and which, in contact with water, do not emit flammable gases are substances of Class 8 (see marginal 2801, 37°).

2° The following boron trifluoride complex:

(a) 2965 boron trifluoride dimethyletherate.

3° Organometallic compounds and their solutions:

(a) 1928 methyl magnesium bromide in ethyl ether, 3207 organometallic compounds or 3207 solutions of organometallic compounds or 3207 dispersions of organometallic compounds, water reactive, flammable, n.o.s.;

NOTE: Special packing conditions are applicable to these substances (see marginal 2473(2)).

(b) 3207 organometallic compounds or 3207 solutions of organometallic compounds or 3207 dispersions of organometallic compounds, water-reactive, flammable, n.o.s.;

(c) 3207 organometallic compounds or 3207 solutions of organometallic compounds or 3207 dispersions of organometallic compounds, water reactive, flammable, n.o.s.

2471 (cont'd)

NOTE 1: Organometallic compounds and their solutions which ignite spontaneously are substances of Class 4.2 (see marginal 2431, 31° to 33°).

NOTE 2: Flammable solutions with organometallic compounds in concentrations which, in contact with water, neither emit flammable gases in dangerous quantities nor ignite spontaneously are substances of Class 3.

B. Inorganic substances which, in contact with water, emit flammable gases

NOTE 1: The term alkali metals includes the elements lithium, sodium, potassium, rubidium and caesium.

NOTE 2: The term alkaline earth metals includes the elements magnesium, calcium, strontium and barium.

11° Alkali metals and alkaline earth metals and their alloys and metallic compounds:

(a) 1389 alkali metal amalgams, 1391 alkali metal dispersions or 1391 alkaline earth metal dispersions, 1392 alkaline earth metal amalgams, 1407 caesium, 1415 lithium, 1420 potassium metal alloys, 1422 potassium sodium alloys, 1423 rubidium, 1428 sodium, 2257 potassium, 1421 alkali metal alloys, liquid, n.o.s.;

(b) 1400 barium, 1401 calcium, 1393 alkaline-earth metal alloys, n.o.s.;

(c) 2950 magnesium granules, coated with a particle size not less than 149 microns.

NOTE 1: Alkaline-earth metals and alkaline earth metal alloys in pyrophoric form are substances of Class 4.2 (see marginal 2431, 12°).

NOTE 2: 1869 magnesium or 1869 magnesium alloys containing more than 50% magnesium as pellets, shavings or strips, are substances of Class 4.1 (see marginal 2401, 13°(c)).

NOTE 3: 1418 magnesium powder and 1418 magnesium alloys in powder form are substances of 14°.

12° Silicon alloys and metal silicides:

(b) 1405 calcium silicide, 1417 lithium silicon, 2624 magnesium silicide, 2830 lithium ferrosilicon;

(c) 1405 calcium silicide, 2844 calcium manganese silicon.

NOTE: For substances of (c) see also marginal 2471a.

2471 (cont'd) 13° Other metals, metal alloys and mixtures, non-toxic, which in contact with water, emit flammable gases:

(a) 3208 metal substances, water-reactive, n.o.s.;

(b) 1396 aluminium powder, uncoated, 3078 cerium, turnings or gritty powder, 3170 aluminium dross, 3208 metal substances, water-reactive, n.o.s.;

(c) 1398 aluminium silicon powder, uncoated, 1435 zinc ashes, 3170 aluminium dross, 3208 metal substances, water reactive, n.o.s.

NOTE 1: Dust and powder of metals in pyrophoric form are substances of Class 4.2 (see marginal 2431, 12°).

NOTE 2: Aluminium silicon powder, coated, is not subject to the provisions of ADR.

NOTE 3: 1333 cerium in slabs, rods or ingots is a substance of Class 4.1 (see marginal 2401, 13°(b))

14° Metals and metal alloys in the form of powder or in any other form, which, in contact with water, emit flammable gases and are capable of self-heating:

(a) 1436 zinc powder or 1436 zinc dust, 3209 metallic substances, water-reactive, self-heating, n.o.s.;

(b) 1418 magnesium powder or 1418 magnesium alloys powder, 1436 zinc powder or 1436 zinc dust; 3209 metallic substances, water-reactive, self-heating, n.o.s.;

(c) 1436 zinc powder or 1436 zinc dust, 3209 metallic substances, water reactive, self heating, n.o.s.

NOTE 1: Metals and metal alloys in pyrophoric form are substances of Class 4.2 (see marginal 2431, 12°).

NOTE 2: Metals and metal alloys which, in contact with water, do not emit flammable gases and are not pyrophoric or self-heating, but which are easily ignited, are substances of Class 4.1 (see marginal 2401, 13°).

15° Metals and metal alloys, toxic:

(b) 1395 aluminium ferrosilicon powder;

(c) 1408 ferrosilicon with 30% or more but less than 90% silicon.

NOTE: Ferrosilicon containing less than 30% or not less than 90% (mass) silicon is not subject to the provisions of ADR.

2471 (cont'd)

16° Metal hydrides:

(a) 1404 calcium hydride, 1410 lithium aluminium hydride, 1411 lithium aluminium hydride, ethereal, 1413 lithium borohydride, 1414 lithium hydride, 1426 sodium borohydride, 1427 sodium hydride, 1870 potassium borohydride, 2010 magnesium hydride, 2463 aluminium hydride, 1409 metal hydrides, water reactive, n.o.s.;

(b) 2805 lithium hydride, solid, castings, 2835 sodium aluminium hydride, 1409 metal hydrides, water reactive, n.o.s.

NOTE 1: 1871 titanium hydride and 1437 zirconium hydride are substances of Class 4.1 (see marginal 2401, 14°).

NOTE 2: 2870 aluminium borohydride is a substance of Class 4.2 (see marginal 2431, 17° (a))

17° Metal carbides and metal nitrides:

(a) 2806 lithium nitride;

(b) 1394 aluminium carbide, 1402 calcium carbide.

18° Metal phosphides, toxic:

(a) 1360 calcium phosphide, 1397 aluminium phosphide, 1419 magnesium aluminium phosphide, 1432 sodium phosphide, 1433 stannic phosphides, 1714 zinc phosphide, 2011 magnesium phosphide, 2012 potassium phosphide, 2013 strontium phosphide.

NOTE: Compounds of phosphorus with heavy metals such as iron, copper, etc., are not subject to the provisions of ADR.

19° Metal amides and metal cyanamides:

(b) 1390 alkali metal amides;

(c) 1403 calcium cyanamide with more than 0.1 % (mass) calcium carbide.

NOTE 1: Calcium cyanamide containing not more than 0.1% (mass) calcium carbide is not subject to the provisions of ADR.

NOTE 2: 2004 magnesium diamide is a substance of Class 4.2 (see marginal 2431, 16°(b)).

20° Inorganic solid substances and mixtures (such as preparations and wastes) which, in contact with water, emit flammable gases, non toxic and non-corrosive, and which cannot be classified under other collective headings:

(a) 2813 water-reactive solid, n.o.s.;

2471 (cont'd)

(b) 1340 phosphorus pentasulphide (P_2S_5) free from yellow and white phosphorus,
2813 water-reactive solid, n.o.s.;

NOTE: Phosphorus pentasulphide not free from yellow and white phosphorus shall not be accepted for carriage.

(c) 2968 maneb (manganese ethylene 1,2-bis (dithiocarbamate), stabilized against self heating, or 2968 maneb preparations, stabilized against self heating,
2813 water-reactive solid, n.o.s.

NOTE: 2210 maneb or 2210 maneb preparations in self-heating form are substances of Class 4.2 (see marginal 2431, 16° (c)), however, see also marginal 2471a, (c).

21° Inorganic liquid substances and solutions of inorganic substances (such as preparations and wastes) which, in contact with water, emit flammable gases, non-toxic and non-corrosive, and which cannot be classified under other collective headings:

(a) 3148 water-reactive liquid, n.o.s.;

NOTE: Special packing conditions are applicable to this substance (see marginal 2473(2)).

(b) 3148 water-reactive liquid, n.o.s.;

(c) 3148 water-reactive liquid, n.o.s.

22° Inorganic solid substances and mixtures (such as preparations and wastes) which, in contact with water, emit flammable gases, toxic, and which cannot be classified under other collective headings:

(a) 3134 water-reactive solid, toxic, n.o.s.;

(b) 3134 water-reactive solid, toxic, n.o.s.;

(c) 3134 water-reactive solid, toxic, n.o.s.

NOTE: For toxicity criteria, see footnote 1/ to marginal 2600 (1).

23° Inorganic liquid substances and solutions of inorganic substances (such as preparations and wastes) which, in contact with water, emit flammable gases, toxic, and which cannot be classified under other collective headings:

(a) 3130 water-reactive liquid, toxic, n.o.s.;

NOTE: Special packing conditions are applicable to this substance (see marginal 2473(2)).

(b) 3130 water-reactive liquid, toxic, n.o.s.;

(c) 3130 water-reactive liquid, toxic, n.o.s.

NOTE: For toxicity criteria, see footnote 1/ to marginal 2600 (1).

2471 (cont'd) 24° Inorganic solid substances and mixtures (such as preparations and wastes) which, in contact with water, emit flammable gases, corrosive, and which cannot be classified under other collective headings:

(a) 3131 water-reactive solid, corrosive, n.o.s.;

(b) 3131 water reactive solid, corrosive, n.o.s.;

(c) 3131 water reactive solid, corrosive, n.o.s.

NOTE: For corrosivity criteria, see footnote 1/ to marginal 2800 (1).

25° Inorganic liquid substances and solutions of inorganic substances (such as preparations and wastes) which, in contact with water, emit flammable gases, corrosive, and which cannot be classified under other collective headings:

(a) 3129 water-reactive liquid, corrosive, n.o.s.;

NOTE: Special packing conditions are applicable to this substance (see marginal 2473(2).

(b) 3129 water-reactive liquid, corrosive, n.o.s.;

(c) 3129 water-reactive liquid, corrosive, n.o.s.

NOTE: For corrosiveness criteria, see footnote 1/ to marginal 2800 (1).

C. Empty packagings

31° Empty packagings, including empty intermediate bulk containers (IBCs), empty tank vehicles, empty demountable tanks and empty tank containers, uncleaned, as well as empty vehicles for carriage in bulk and empty small bulk containers, uncleaned, which have contained substances of Class 4.3.

2471a 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:

(a) Substances classified under (a) of each item are not covered by this marginal;

(b) Substances classified under (b) of each item:
liquids: up to 500 ml per inner packaging;
aluminium powder of 13°(b): up to 1 kg per inner packaging;
other solids: up to 500 g per inner packaging;

(c) Substances classified under (c) of each item:
liquids: up to 1 litre per inner packaging;
solids: up to 1 kg per inner packaging.

These quantities of substances shall be carried in combination packagings which at least meet the conditions of marginal 3538. A package shall not weigh more than 30 kg.

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

2. Provisions

A. Packages

1. General conditions of packing

2472 (1) Packagings shall satisfy the conditions of Appendix A.5, unless special conditions for the packing of certain substances are prescribed in marginal 2473.

Intermediate bulk containers (IBCs) shall satisfy the conditions of Appendix A.6.

(2) Packagings shall be hermetically closed so as to prevent any infiltration of humidity or any loss of the contents. They shall not have vents in accordance with marginals 3500 (8) or 3601 (6).

(3) In accordance with the provisions of marginals 2470 (3) and 3511 (2) or 3611 (2) respectively, the following shall be used:

Packagings of packing group I, marked with the letter "X", for very dangerous substances classified under (a) of each item,

Packagings of packing group II or I, marked with the letter "Y" or "X", or intermediate bulk containers (IBCs) of packing group II, marked with the letter "Y", for dangerous substances classified under (b) of each item,

Packagings of packing group III, II or I, marked with the letter "Z", "Y" or "X", or intermediate bulk containers (IBCs) of packing group III or II, marked with the letter "Z" or "Y", for less dangerous substances classified under (c) of each item.

NOTE: For the carriage of substances of Class 4.3 in tank vehicles, demountable tanks or tank containers, and for carriage in bulk, see Annex B.

2. Special conditions for packing of certain substances

2473 (1) Chlorosilanes of 1° (a) shall be packed in corrosion resistant steel receptacles with a maximum capacity of 450 litres. The receptacles shall be subjected to the initial test and periodic tests every five years at a pressure of not less than 0.4 MPa (4 bar) (gauge pressure). The closing device of the receptacle shall be protected by a cap. The maximum permissible mass of filling per litre of capacity for trichlorosilane, ethyldichlorosilane and methyldichlorosilane shall not exceed 1.14 kg, 0.93 kg or 0.95 kg respectively, if the filling is carried out by mass; if the filling is by volume, the degree of filling shall not exceed 85%. Receptacles shall also carry a plate showing the following particulars in a durable form:

2473 (cont'd)

chlorosilanes, Class 4.3;

description of the chlorosilane(s) accepted for carriage;

tare 1/ of the receptacle, including accessories;

test pressure 1/ (gauge pressure);

date (month, year) of the last test undergone;

stamp of the expert who carried out the test;

capacity 1/ of the receptacle;

maximum degree of filling allowed by mass 1/ for each substance accepted for carriage.

(2) Substances of 3° (a), 21° (a), 23° (a) and 25° (a) shall be packed in hermetically closing metal receptacles which are not affected by the contents and have a capacity of not more than 450 litres. The receptacles shall be subjected to the initial test and periodic tests every five years at a pressure of at least 1 MPa (10 bar) (gauge pressure).

The receptacles shall not be filled to more than 90% of their capacity; however, a space of 5% shall remain empty for safety when the liquid is at an average temperature of 50° C. During carriage, the liquid shall be under a layer of inert gas, the gauge pressure of which shall be not less than 50 kPa (0.5 bar). The receptacles shall carry a plate showing the following particulars in a durable form:

substance or substances 2/ accepted for carriage;

tare 1/ of the receptacle, including accessories;

test pressure 1/ (gauge pressure);

date (month, year) of the last test undergone;

stamp of the expert who carried out the test;

capacity 1/ of the receptacle;

maximum mass of filling allowed 1/.

1/ The units of measurement to be added each time after the numerical values.

2/ The name may be replaced by a collective description covering substances of a similar nature and equally compatible with the properties of the receptacle.

2473 (cont'd) (3) Substances referred to in paragraph (2) above may also be packed combination packagings conforming to marginal 3538 with a glass inner packaging and a steel or aluminium outer packaging conforming to marginal 3532. Receptacles shall not be filled to more than 90% of their capacity. A package shall contain only a single inner packaging. 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.

2474 (1) Substances classified under (a) of 2°, 11°, 13°, 14°, 16° to 18°, 20°, 22° and 24°, shall be packed in:

(a) non-removable head steel drums conforming to marginal 3520, or

(b) non-removable head aluminium drums conforming to marginal 3521, or

(c) non-removable head steel jerricans conforming to marginal 3522, or

(d) non removable head plastics drums with a maximum capacity of 60 litres and non removable head plastics jerricans conforming to marginal 3526, or

(e) composite packagings (plastics material) conforming to marginal 3537, or

(f) combination packagings with glass, plastics material or metal inner receptacles conforming to marginal 3538.

(2) Solids as defined in marginal 2470 (10) may also be packed in:

(a) removable head drums conforming to marginal 3520 for steel, marginal 3521 for aluminium, marginal 3526 for plastics material, or in removable head jerricans conforming to marginal 3522 for steel or marginal 3526 for plastics material, or

(b) combination packagings conforming to marginal 3538 with one or more sift-proof inner bags.

2475 (1) Substances classified under (b) of the various items shall be packed in:

(a) steel drums conforming to marginal 3520, or

(b) aluminium drums conforming to marginal 3521, or

(c) steel jerricans conforming to marginal 3522, or

(d) plastics drums and jerricans conforming to marginal 3526, or

(e) composite packagings (plastics material) conforming to marginal 3537, or

2475 (cont'd)

(f) combination packagings conforming to marginal 3538, or

(g) composite packagings (glass, porcelain, stoneware) conforming to marginal 3539.

(2) Substances of 12° to 17° and 20° may also be packed in:

(a) metal intermediate bulk containers (IBCs) conforming to marginal 3622, or

(b) rigid plastics intermediate bulk containers (IBCs) conforming to marginal 3624, or

(c) composite intermediate bulk containers (IBCs) with plastics inner receptacle conforming to marginal 3625, with the exception of types 11HZ2 and 31HZ2.

(3) Solids as defined in marginal 2470 (10) may also be packed in:

(a) plywood drums conforming to marginal 3523 or in fibre drums conforming to marginal 3525, if necessary with one or more sift-proof inner bags, or

(b) plastics film bags conforming to marginal 3535, provided that they make up a full load or are loaded on pallets.

2476 (1) Substances classified under (c) of the various items shall be packed in:

(a) steel drums conforming to marginal 3520, or

(b) aluminium drums conforming to marginal 3521, or

(c) steel jerricans conforming to marginal 3522, or

(d) plastics drums and jerricans conforming to marginal 3526, or

(e) composite packagings (plastics material) conforming to marginal 3537, or

(f) combination packagings conforming to marginal 3538, or

(g) composite packagings (glass, porcelain, stoneware) conforming to marginal 3539, or

(h) light gauge metal packagings conforming to marginal 3540, or

(i) metal intermediate bulk containers (IBCs) conforming to marginal 3622, or

(j) rigid plastics intermediate bulk containers (IBCs) conforming to marginal 3624, or

(k) composite intermediate bulk containers (IBCs) with plastics inner receptacle conforming to marginal 3625 with the exception of types 11HZ2 and 31HZ2.

2476 (cont'd) (2) Solids as defined in marginal 2470 (10) may also be packed in:

(a) plywood drums conforming to marginal 3523 or fibre drums conforming to marginal 3525, if necessary with one or more sift proof inner bags, or

(b) plastics film bags conforming to marginal 3535, or

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

2477 The openings of receptacles for substances of 23° shall be tightly closed by means of two devices in series, one of which shall be screwed or secured in an equivalent manner.

NOTE: For intermediate bulk containers (IBCs), see, however, marginal 3621 (8).

2478-2480

3. Mixed packing

2481 (1) Substances classified under the same item may be packed together in a combination packaging conforming to marginal 3538.

(2) Substances classified under (a) of the various items may not be packed together with substances of the various items of Class 4.3, with substances and articles of other classes or with goods which are not subject to the provisions of ADR.

(3) With the exception of the substances referred to in (2), substances of the various items of Class 4.3, in quantities not exceeding 3 litres for liquids and/or 6 kg for solids per receptacle, may be packed together in a combination packaging conforming to marginal 3538 with each other, with substances or articles of other classes · provided that mixed packing is also permitted for substances and articles of those classes and/or with goods not subject to the provisions of ADR, provided they do not react dangerously with one another.

(4) The following shall be 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 provisions of marginals 2001 (7), 2002 (6) and (7) and 2472 shall be observed.

(6) If wooden or fibreboard cases are used, a package shall not weigh more than 100 kg.

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

Danger labels

2482 (1) Packages containing substances of Class 4.3 shall bear a label conforming to model No. 4.3.

(2) Packages containing substances of 1° and 2° shall, in addition, bear a label conforming to models Nos. 3 and 8.

(3) Packages containing substances of 3° and lithium aluminium hydride, ethereal, of 16° (a) shall, in addition, bear a label conforming to model No. 3.

(4) Packages containing substances of 14° shall, in addition, bear a label conforming to model No. 4.2.

(5) Packages containing substances of 15°, 18°, 22° and 23° shall, in addition, bear a label conforming to model No. 6.1.

(6) Packages containing substances of 24° and 25° shall, in addition, bear a label conforming to model No. 8.

(7) Packages containing fragile receptacles not visible from the outside shall, in addition, bear on two opposite sides a label conforming to model No. 12.

(8) Packages containing liquids in receptacles the closures of which are not visible from the outside shall bear on two opposite sides a label conforming to model No. 11.

2483

B. Particulars in the transport document

2484 The description of the goods in the transport document shall conform to one of the identification numbers and names underlined in marginal 2471.

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 identification number and the n.o.s. designation, followed by the chemical or technical name of substance 1/.

The description of the goods shall be followed by particulars of the class, the item number, the letter and the initials "ADR" (or "RID") e.g. "4.3, 1° (a), ADR".

For the carriage of wastes (see marginal 2000 (4)), the description of the goods shall be: "Waste containing ...", the component(s) used for the classification of the waste under marginal 2002 (8) to be entered under its/their chemical name(s), e.g. "Waste, earth containing 1428 sodium, 4.3, 11° (a), ADR."

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

2484 (cont'd) For the carriage of solutions and mixtures (such as preparations and wastes) containing several components subject to the provisions of ADR, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures.

If a named substance in accordance with marginal 2470 (9) is not subject to the conditions of this Class, the consignor may enter in the transport document: "Not goods of Class 4.3.".

2485-2491

C. Empty packagings

2492 (1) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), of 31° shall be closed in the same manner and be leakproof to the same degree as if they were full.

(2) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), of 31° 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 underlined in 31°, e.g. "Empty packaging, 4.3, 31°, ADR". In the case of empty tank vehicles, empty demountable tanks, empty tank containers and empty small containers, uncleaned, this description shall be completed by the words "Last load" together with the name and item number of the goods last loaded, e.g. "Last load: 1295 trichlorosilane, 1^{o} (a)".

2493-2494

D. Transitional measures

2495 Substances of Class 4.3 may be carried until 30 June 1993 in accordance with the provisions for Class 4.3 applicable until 31 December 1992. The transport document shall, in such cases, bear the inscription: "Carriage in accordance with the ADR in force before 1 January 1993".

2496-2499

CLASS 5.1. OXIDIZING SUBSTANCES

1. List of substances

2500 (1) Among the substances covered by the title of Class 5.1, those which are listed in marginal 2501 or are covered by a collective heading in that marginal are subject to the conditions set out in marginals 2500(2) to 2522 and to the provisions of this Annex and of Annex B. They are then considered as substances of ADR.

2500 (cont'd) NOTE: For the quantities of substances listed in marginal 2501 which are not subject to the provisions for this Class, either in this Annex or in Annex B, see marginal 2501a.

(2) The title of Class 5.1 covers substances which, while in themselves not necessarily combustible, may, generally by yielding oxygen, cause or contribute to the combustion of other material.

(3) The substances of Class 5.1 are subdivided as follows:

A. Liquid oxidizing substances and their aqueous solutions
B. Solid oxidizing substances and their aqueous solutions
C. Empty packagings

Substances of Class 5.1 (other than the substances of 5° and 20°) which are classified under the various items of marginal 2501 shall be assigned to one of the following groups designated by the letter (a), (b) or (c) according to their degree of danger.

(a) highly oxidizing;
(b) oxidizing;
(c) slightly oxidizing.

(4) Solid 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 Appendix A.3, marginals 3350 and 3351. In the event of divergence between test results and known experience, judgement based on known experience shall take precedence over test results. Liquid oxidizing substances not specifically named shall be assigned to Class 5.1 on the basis of experience.

(5) When substances not specifically named are assigned to the items of marginal 2501 on the basis of the test procedure in accordance with Appendix A.3, marginals 3350 and 3351, the following criterion applies:

a substance shall be assigned to Class 5.1 if, in either concentration tested, the mean burning time of the sawdust, established from three tests, is equal to or less than that of the average of the three tests with ammonium persulphate mixture.

(6) When substances not specifically named are assigned to the letters of the items of marginal 2501 on the basis of the test procedure in accordance with Appendix A.3, marginals 3350 and 3351, the following criteria apply:

A substance shall be assigned to letter (a) when, in either concentration tested, it exhibits a burning time less than with potassium bromate.

A substance shall be assigned to letter (b) when, in either concentration tested, it exhibits a burning time equal to or less than with potassium perchlorate and the criteria for letter (a) are not met.

A substance shall be assigned to letter (c) when, in either concentration tested, it exhibits a burning time equal to or less than with ammonium persulphate and the criteria for groups/letters (a) or (b) are not met.

2500 (cont'd) (7) If substances of Class 5.1, as a result of admixtures, come into different categories of risk from those to which the substances of marginal 2501 belong, these mixtures or solutions shall be assigned to the items and letters to which they belong on the basis of their actual degree of danger.

NOTE: For the classification of solutions and mixtures (such as preparations and wastes), see also marginal 2002(8).

(8) 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 procedure in accordance with Appendix A.3, marginals 3350 and 3351, and the criteria set out in paragraph (6).

(9) On the basis of the test procedure in accordance with Appendix A.3, marginals 3350 and 3351, and the criteria set out in paragraph (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).

(10) For the packaging requirements of marginals 2506(2), 2507(2) and 2508(2), substances or mixtures of substances having a melting point above 45° C are considered to be solids.

(11) The chemically unstable substances of Class 5.1 shall be accepted for carriage only if the necessary steps have been taken to prevent their dangerous decomposition or polymerization during carriage. To this end it shall in particular be ensured that receptacles do not contain any material liable to promote these reactions.

(12) Oxidizing solids, self heating, assigned to identification number 3100, oxidizing solids, water reactive, assigned to identification number 3121 and oxidizing solids, flammable, assigned to identification number 3137 of the United Nations Recommendations shall not be accepted for carriage (see, however, marginal 2002(8), footnote 1/ to the table contained in paragraph 2.3.1).

2501 **A. Liquid oxidizing substances and their aqueous solutions**

1° Hydrogen peroxide and its solutions, or mixtures of hydrogen peroxide with another liquid in aqueous solution:

(a) 2015 hydrogen peroxide, stabilized, or 2015 hydrogen peroxide, aqueous solutions, stabilized with more than 60% hydrogen peroxide;

NOTE 1. Special packing conditions are applicable to these substances (see marginal 2503).

NOTE 2. Hydrogen peroxide, not stabilized or hydrogen peroxide, aqueous solutions, not stabilized containing more than 60% hydrogen peroxide, shall not be accepted for carriage.

(b) 2014 hydrogen peroxide, aqueous solutions with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary); 3149 hydrogen peroxide and peroxyacetic acid mixture, stabilized, with acid(s), water and not more than 5% peroxyacetic acid;

2501 (cont'd)

NOTE: This mixture of hydrogen peroxide and peroxyacetic acid (No. 3149) shall, in laboratory testing 1/, neither detonate in the cavitated state nor deflagrate at all and shall show no effect when heated under confinement nor any explosive power. The formulation shall be thermally stable (self accelerating decomposition temperature 60° C or higher for a 50kg package), and an organic liquid compatible with peroxyacetic acid and with a boiling point not less than 150° C shall be used for desensitization. Formulations not meeting these criteria are to be regarded as substances of Class 5.2 (see Appendix A.1, marginal 3104(2) (g)).

(c) 2984 hydrogen peroxide, aqueous solutions, with not less than 8% but less than 20% hydrogen peroxide (stabilized as necessary).

NOTE: Hydrogen peroxide, aqueous solutions containing less than 8% hydrogen peroxide are not subject to the provisions of ADR.

2° Tetranitromethane:

(a) 1510 tetranitromethane.

NOTE: Tetranitromethane not free from combustible impurities shall not be accepted for carriage.

3° Perchloric acid solution:

(a) 1873 perchloric acid in aqueous solution with more than 50% but not more than 72% acid, by mass.

NOTE 1: Perchloric acid solutions containing more than 72% (mass) acid, or mixtures of perchloric acid with any liquid other than water, shall not be accepted for carriage.

NOTE 2: Perchloric acid solutions containing not more than 50% (mass) acid are substances of Class 8 (see marginal 2801, 4°).

4° Chloric acid solution:

(b) 2626 chloric acid, aqueous solution, with not more than 10% chloric acid.

NOTE: Chloric acid solution containing more than 10% chloric acid or mixtures of chloric acid with any liquid other than water shall not be accepted for carriage.

5° The following halogenated compounds of fluorine:

1745 bromine pentafluoride, 1746 bromine trifluoride, 2495 iodine pentafluoride.

1/ See United Nations Recommendations on the Transport of Dangerous Goods, paragraph 11.3.3.

2501 (cont'd)

NOTE 1. Special packing conditions are applicable to these substances (see marginal 2504).

NOTE 2. Other halogenated compounds of fluorine shall not be accepted for carriage as substances of Class 5.1.

B. Solid oxidizing substances and their aqueous solutions

11° Chlorates and mixtures of chlorates with borates or hygroscopic chlorides (such as magnesium chloride or calcium chloride):

(b) 1452 calcium chlorate, 1458 chlorate and borate mixtures, 1459 chlorate and magnesium chloride mixtures, 1485 potassium chlorate, 1495 sodium chlorate, 1506 strontium chlorate, 1513 zinc chlorate, 2427 potassium chlorate, aqueous solution, 2428 sodium chlorate, aqueous solution, 2429 calcium chlorate, aqueous solution, 2721 copper chlorate, 2723 magnesium chlorate, 1461 chlorates, inorganic, n.o.s., 3210 chlorates, inorganic, aqueous solutions, n.o.s.

NOTE 1: See also 29°.

NOTE 2: Ammonium chlorate and mixtures of a chlorate with an ammonium salt shall not be accepted for carriage.

12° Ammonium perchlorate:

(b) 1442 ammonium perchlorate

NOTE: 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 1 (marginal 2101, 4°, No. 0402).

13° Perchlorates (with the exception of ammonium perchlorate, see 12°):

(b) 1455 calcium perchlorate, 1475 magnesium perchlorate, 1489 potassium perchlorate, 1502 sodium perchlorate, 1508 strontium perchlorate, 1481 perchlorates, inorganic, n.o.s., 3211 perchlorates, inorganic, aqueous solutions, n.o.s.

NOTE: See also 29°.

14° Chlorites:

(b) 1453 calcium chlorite, 1496 sodium chlorite, 1462 chlorites, inorganic, n.o.s.

NOTE 1: Solutions of chlorites are substances of Class 8 (see marginal 2801, 61°).

NOTE 2: Ammonium chlorite and mixtures of a chlorite with an ammonium salt shall not be accepted for carriage.

2501 (cont'd)

15° Hypochlorites:

(b) 1471 lithium hypochlorite, dry or 1471 lithium hypochlorite mixtures, 1748 calcium hypochlorite, dry or 1748 calcium hypochlorite mixtures, dry with more than 39% available chlorine (8.8% available oxygen), 2880 calcium hypochlorite, hydrated or 2880 calcium hypochlorite, hydrated mixtures with not less than 5.5% but not more than 10% water,
3212 hypochlorites, inorganic, n.o.s.;

(c) 2208 calcium hypochlorite mixtures, dry with more than 10% but not more than 39% available chlorine.

NOTE 1: Calcium hypochlorite mixtures, dry, containing not more than 10% available chlorine are not subject to the provisions of ADR.

NOTE 2: Solutions of hypochlorites are substances of Class 8 (see marginal 2801, 61°).

NOTE 3: Mixtures of a hypochlorite with an ammonium salt shall not be accepted for carriage.

NOTE 4: See also 29°.

16° Bromates:

(b) 1473 magnesium bromate, 1484 potassium bromate, 1494 sodium bromate,
1450 bromates, inorganic, n.o.s., 3213 bromates, inorganic, aqueous solutions, n.o.s.;

(c) 2469 zinc bromate,
3213 bromates, inorganic, aqueous solutions, n.o.s.

NOTE 1: Ammonium bromate and mixtures of a bromate with an ammonium salt shall not be accepted for carriage.

NOTE 2: See also 29°.

17° Permanganates:

(b) 1456 calcium permanganate, 1490 potassium permanganate, 1503 sodium permanganate, 1515 zinc permanganate, 1482 permanganates, inorganic, n.o.s., 3214 permanganates, inorganic, aqueous solutions, n.o.s.

NOTE 1: Ammonium permanganate and mixtures of a permanganate with an ammonium salt shall not be accepted for carriage.

NOTE 2: See also 29°.

18° Persulphates:

(c) 1444 ammonium persulphate, 1492 potassium persulphate, 1505 sodium persulphate,
3215 persulphates, inorganic, n.o.s., 3216 persulphates, inorganic, aqueous solutions, n.o.s.

2501 (cont'd)

19° Percarbonates:

(c) 2467 sodium percarbonates,
3217 percarbonates, inorganic, n.o.s.

NOTE: Sodium carbonate peroxyhydrate is not subject to the provisions of ADR.

20° Ammonium nitrate solutions:

2426 ammonium nitrate, liquid, hot concentrated solution, in a concentration of more than 80% but not more than 93%, provided that:

1. the pH is between 5 and 7 measured in an aqueous solution of 10% of the substance carried,

2. the solution does not contain more than 0.2% combustible material or chlorine compounds in quantities such that the chlorine level exceeds 0.02%.

NOTE: Aqueous solutions of ammonium nitrate, in a concentration not exceeding 80%, are not subject to the provisions of ADR.

21° Ammonium nitrate and ammonium nitrate fertilizers[1/]:

(c) 1942 ammonium nitrate with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance,
2067 ammonium nitrate fertilizers, type A1: uniform non segregating mixtures of ammonium nitrate with added matter which is inorganic and chemically inert towards ammonium nitrate, with not less than 90% ammonium nitrate and not more than 0.2% combustible material (including organic material calculated as carbon), or with more than 70% but less than 90% ammonium nitrate and not more than 0.4% total combustible material,
2068 ammonium nitrate fertilizers, type A2: uniform non segregating mixtures of ammonium nitrate with calcium carbonate and/or dolomite, with more than 80% but less than 90% ammonium nitrate and not more than 0.4% total combustible material,
2069 ammonium nitrate fertilizers, type A3: uniform non segregating mixtures of ammonium nitrate and ammonium sulphate, with more than 45% but not more than 70% ammonium nitrate and not more than 0.4% total combustible material,

1/ Fertilizers containing ammonium nitrate which are assigned to United Nations Recommendations identification number 2071 are not subject to the provisions of ADR. Fertilizers containing ammonium nitrate which are assigned to United Nations Recommendations identification number 2072 shall not be accepted for carriage.

2501 (cont'd)

2070 ammonium nitrate fertilizers, type A1: uniform non-segregating mixtures of nitrogen/phosphate or nitrogen/potash types or complete fertilizers of nitrogen/phosphate/potash type, with more than 70% but less than 90% ammonium nitrate and not more than 0.4% total combustible material.

NOTE 1: Ammonium nitrate containing more than 0.2% combustible substances (including any organic substance calculated as carbon) shall not be accepted for carriage unless it is a constituent of a substance or article of Class 1.

NOTE 2: In determining the ammonium nitrate content, all nitrate ions for which a molecular equivalent of ammonium ions is present in the mixture shall be calculated as ammonium nitrate.

NOTE 3: Fertilizers having an ammonium nitrate content or a content in combustible substances exceeding the values shown shall not be accepted for carriage except under the conditions applicable to Class 1. See also Note 5.

NOTE 4: Fertilizers having an ammonium nitrate content below the limit values indicated are not subject to the provisions of ADR.

NOTE 5: Ammonium nitrate fertilizers, uniform non-segregating mixtures of nitrogen/phosphate or nitrogen/potash types or complete fertilizers of nitrogen/phosphate/potash type whose molecular excess of nitrate ions over ammonium ions (calculated as potassium nitrate) is less than 10% are not subject to the provisions of ADR, provided that:

(a) their ammonium nitrate content is not more than 70% and their total content of combustible material is not more than 0.4%, or

(b) their ammonium nitrate content is not more than 45% irrespective of their content of combustible material.

22° Nitrates (with the exception of substances of 20°, 21° and 29°):

(b) 1493 silver nitrate, 1514 zinc nitrate, 1477 nitrates, inorganic, n.o.s., 3218 nitrates, inorganic, aqueous solutions, n.o.s.;

(c) 1438 aluminium nitrate, 1451 caesium nitrate, 1454 calcium nitrate, 1465 didymium nitrate, 1466 ferric nitrate, 1467 guanidine nitrate, 1474 magnesium nitrate, 1486 potassium nitrate, 1498 sodium nitrate, 1499 sodium nitrate and potassium nitrate mixtures, 1507 strontium nitrate, 2720 chromium nitrate, 2722 lithium nitrate, 2724 manganese nitrate, 2725 nickel nitrate, 2728 zirconium nitrate, 1477 nitrates, inorganic, n.o.s., 3218 nitrates, inorganic, aqueous solutions, n.o.s.

2501 (cont'd)

NOTE 1: Mercuric nitrate, mercurous nitrate, thallium nitrate and cadmium nitrate are substances of Class 6.1 (see marginal 2601, 52° (b), 53° (b) and 61° (c)). 2976 thorium nitrate, solid, 2980 uranyl nitrate hexahydrate solution and 2981 uranyl nitrate, solid are substances of Class 7 (see marginal 2704, schedules 5, 6, 9, 10, 11 and 13).

NOTE 2: The commercial grade of calcium nitrate fertilizer, consisting mainly of a double salt (calcium nitrate and ammonium nitrate) and containing not more than 10% ammonium nitrate and at least 12% water of crystallization, is not subject to the provisions of ADR.

23° Nitrites:

(b) 1488 potassium nitrite, 1512 zinc ammonium nitrite, 2627 nitrites, inorganic, n.o.s., 3219 nitrites, inorganic, aqueous solutions, n.o.s.;

(c) 1500 sodium nitrite, 2726 nickel nitrite, 3219 nitrites, inorganic, aqueous solutions, n.o.s.

NOTE 1: Ammonium nitrite and mixtures of an inorganic nitrite with an ammonium salt shall not be accepted for carriage.

NOTE 2: Zinc ammonium nitrite is not permitted for carriage on sea routes.

24° Mixtures of nitrates and nitrites of items 22° and 23°.

(b) 1487 potassium nitrate and sodium nitrite mixtures.

NOTE: Mixtures with an ammonium salt shall not be accepted for carriage.

25° Peroxides and superoxides:

(a) 1491 potassium peroxide, 1504 sodium peroxide, 2466 potassium superoxide, 2547 sodium superoxide;

(b) 1457 calcium peroxide, 1472 lithium peroxide, 1476 magnesium peroxide, 1509 strontium peroxide, 1516 zinc peroxide, 1483 peroxides, inorganic, n.o.s.

NOTE: See also 29°.

26° Chloroisocyanuric acids and their salts:

(b) 2465 dichloroisocyanuric acid, dry or 2465 dichloro isocyanuric acid salts, 2468 trichloroisocyanuric acid, dry.

NOTE: The dihydrated sodium salt of dichloroisocyanuric acid is not subject to the provisions of ADR.

2501 (cont'd)

27° Solid oxidizing substances, non toxic, non corrosive, and mixtures of these substances (such as preparations and wastes) which cannot be classified under other collective headings:

(a) 1479 oxidizing solid, n.o.s.;

(b) 1439 ammonium dichromate, 3247 sodium peroxoborate, anhydrous,
1479 oxidizing solid, n.o.s.;

(c) 1479 oxidizing solid, n.o.s.

28° Aqueous solutions of solid oxidizing substances, non toxic, non corrosive, and of mixtures of these substances (such as preparations and wastes) which cannot be classified under other collective headings:

(b) 3139 oxidizing liquid, n.o.s;

(c) 3139 oxidizing liquid, n.o.s.

29° Solid oxidizing substances, toxic, and mixtures of these substances (such as preparations and wastes) which cannot be classified under other collective headings:

(a) 3087 oxidizing solid, toxic, n.o.s.;

(b) 1445 barium chlorate, 1446 barium nitrate, 1447 barium perchlorate, 1448 barium permanganate, 1449 barium peroxide, 1469 lead nitrate, 1470 lead perchlorate, 2464 beryllium nitrate, 2573 thallium chlorate, 2719 barium bromate, 2741 barium hypochlorite with more than 22% available chlorine,
3087 oxidizing solid, toxic, n.o.s.;

(c) 1872 lead dioxide,
3087 oxidizing solid, toxic, n.o.s.

NOTE: For toxicity criteria, see footnote 1/ to marginal 2600(1).

30° Aqueous solutions of solid oxidizing substances, toxic, and of mixtures of these substances (such as preparations and wastes) which cannot be classified under other collective headings:

(a) 3099 oxidizing liquid, toxic, n.o.s.;

(b) 3099 oxidizing liquid, toxic, n.o.s.;

(c) 3099 oxidizing liquid, toxic, n.o.s.

NOTE: For toxicity criteria, see footnote 1/ to marginal 2600(1).

31° Solid oxidizing substances, corrosive, and mixtures of these substances (such as preparations and wastes) which cannot be classified under other collective headings:

2501 (cont'd)

(a) 3085 oxidizing solid, corrosive, n.o.s.;

(b) 1463 chromium trioxide, anhydrous (solid chromic acid), 3085 oxidizing solid, corrosive, n.o.s.;

(c) 1511 urea hydrogen peroxide, 3085 oxidizing solid, corrosive, n.o.s.

NOTE 1: For corrosiveness criteria, see footnote 1/ to marginal 2800(1).

NOTE 2. Solutions of chromic acid are substances of Class 8 (see marginal 2801, 11° (b)).

32° Aqueous solutions of solid oxidizing substances, corrosive, and of mixtures of these substances (such as preparations and wastes) which cannot be classified under other collective headings:

(a) 3098 oxidizing liquid, corrosive, n.o.s.;

(b) 3098 oxidizing liquid, corrosive, n.o.s.;

(c) 3098 oxidizing liquid, corrosive, n.o.s.

NOTE: For corrosivity criteria, see footnote 1/ to marginal 2800(1).

C. Empty packagings

NOTE. Empty packagings with residues from their previous contents adhering to the outside shall not be accepted for carriage.

41° Empty packagings, including empty intermediate bulk containers (IBCs), empty tank vehicles, empty demountable tanks and empty tank containers, uncleaned as well as empty vehicles for carriage in bulk and empty small bulk containers, uncleaned, which have contained substances of Class 5.1.

2501a 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:

(a) Substances classified under (a) of each item are not covered by this marginal.

(b) Substances classified under (b) of each item:
liquids: not more than 500ml per inner packaging;
solids: not more than 500g per inner packaging;

(c) Substances classified under (c) of each item:
liquids: not more than 1 litre per inner packaging;
solids: not more than 1kg per inner packaging.

These quantities of substances shall be carried in combination packagings which at least meet the conditions of marginal 3538. A package shall not weigh more than 30kg.

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

2. Provisions

A. Packages

1. General conditions of packing

2502 (1) Packagings shall satisfy the conditions of Appendix A.5, unless special conditions for the packing of certain substances are prescribed in marginals 2503 and 2504.

(2) Intermediate bulk containers (IBCs) shall satisfy the conditions of Appendix A.6.

(3) In accordance with the provisions of marginals 2500(3) and 3511(2) or 3611(2) respectively the following shall be used:

packagings of packing group I, marked with the letter "X" for the strongly oxidizing substances classified under the letter (a) of each item;

packagings of packing group II or I, marked with the letter "Y" or "X", or IBCs of packing group II, marked with the letter "Y", for the oxidizing substances classified under the letter (b) of each item;

packagings of packing group III, II or I, marked with the letter "Z", "Y", or "X", or IBCs of packing group III or II, marked with the letter "Z" or "Y", for the slightly oxidizing substances classified under the letter (c) of each item.

NOTE: For the carriage of substances of Class 5.1 in tank vehicles,demountable tanks or tank containers, and for the carriage in bulk of solids of this Class, see Annex B.

2. Special conditions for packing of certain substances

2503 (1) Substances of 1° (a) shall be packed in:

(a) non removable head drums of aluminium of at least 99.5% purity, conforming to marginal 3521, or in non removable head drums of special steel not liable to cause decomposition of the hydrogen peroxide, conforming to marginal 3520; or

(b) combination packagings conforming to marginal 3538 with inner packagings of glass, plastics or metal not liable to cause decomposition of the hydrogen peroxide. An inner packaging made of glass or plastics shall not contain more than 2 litres: one of metal not more than 5 litres.

Packagings shall be fitted with a vent conforming to marginal 3500(8). These combination packagings shall conform to a design type which has been tested and approved in accordance with Appendix A.5 for packing group I.

2503 (contd) (2) Packagings shall not be filled to more than 90% of their capacity.

(3) A package shall not weigh more than 125 kg.

2504 Substances of 5° shall be carried in cylinders with a capacity of not more than 150 litres, or receptacles with a capacity of not more than 1,000 litres (e.g. cylindrical receptacles with rolling hoops or spherical receptacles), made of carbon steel or of a suitable alloy steel.

(a) The receptacles shall comply with the relevant provisions of Class 2 (see marginals 2211 and 2213(1) and (2)). The receptacles shall be designed for a calculation pressure of not less than 2.1 MPa (21 bar) (gauge pressure). The wall thickness of the receptacles shall not, however, be less than 3mm. Before their first use, the receptacles shall be subjected to a hydraulic pressure test with a gauge pressure of not less than 1 MPa (10 bar). This test shall be repeated every 8 years, accompanied by an internal inspection of the receptacles and a check of the fittings. The receptacles shall in addition be inspected for corrosion every 2 years by means of suitable measuring apparatus (e.g. ultrasound) and also with regard to the condition of the fittings. For the tests and inspections the relevant provisions of Class 2 shall be applicable (see marginals 2215 and 2216).

(b) The receptacles shall not be filled to more than 92% of their capacity.

(c) The following particulars shall be shown on receptacles in a clearly legible and permanent manner:

name of the manufacturer or the manufacturing mark and the number of the receptacle,

description of the substance conforming to marginal 2501, 5°,

tare mass of the receptacle and the permissible maximum mass of the filled receptacle,

date (month, year) of the initial test and of the latest periodical test,

stamp of the expert who carried out the tests and inspections.

2505 Ammonium nitrate solutions of 20° shall be carried only in tank vehicles and demountable tanks (see Appendix B.1a) or in tank containers (see Appendix B.1b).

2506 (1) Substances classified under (a) of the various items, other than 1°(a), of marginal 2501 shall be packed in:

(a) non removable head steel drums conforming to marginal 3520, or

2506 (cont'd)

(b) non removable head aluminium drums conforming to marginal 3521, or

(c) non removable head steel jerricans conforming to marginal 3522, or

(d) non removable head plastics drums of a capacity not exceeding 60 litres or non removable head plastics jerricans conforming to marginal 3526, or

(e) omposite packagings (plastics material) conforming to marginal 3537, or

(f) combination packagings with inner packagings of glass, plastics or metal conforming to marginal 3538.

(2) Perchloric acid of 3°(a) may also be packed in composite packagings (glass) conforming to marginal 3539.

(3) Solid substances within the meaning of marginal 2500(10) may also be packed in:

(a) removable head drums conforming to marginals 3520 for steel, 3521 for aluminium, 3523 for plywood, 3525 for fibreboard, or 3526 for plastics material, or in removable head jerricans conforming to marginals 3522 for steel or 3526 for plastics material, if necessary with one or more sift proof inner bags; or

(b) combination packagings conforming to marginal 3538, with one or more sift proof inner bags.

2507 (1) Substances classified under (b) of the various items of marginal 2501 shall be packed in:

(a) steel drums conforming to marginal 3520, or

(b) aluminium drums conforming to marginal 3521, or

(c) steel jerricans conforming to marginal 3522, or

(d) plastics drums or plastics jerricans conforming to marginal 3526, or

(e) composite packagings (plastics material) conforming to marginal 3537, or

(f) combination packagings conforming to marginal 3538, or

(g) composite packagings (glass, porcelain or stoneware) conforming to marginal 3539, or

(h) metal IBCs conforming to marginal 3622, or

(i) rigid plastics IBCs conforming to marginal 3624, or

(j) composite IBCs with plastics inner receptacle conforming to marginal 3625 with the exception of types 11HZ2 and 31HZ2.

2507 (cont'd) NOTE to (a), (b), (c) and (d): Simplified conditions are applicable to removable head drums and jerricans for viscous substances having a viscosity of more than 200 mm^2/s at 23° C and for solid substances (see marginals 3512, 3553, 3554 and 3560).

(2) Solid substances within the meaning of marginal 2500(10) may also be packed in:

(a) drums conforming to marginal 3523 for plywood or 3525 for fibreboard, if necessary with one or more sift proof inner bags, or

(b) sift proof bags conforming to marginals 3533 for textile material, 3534 for woven plastics material or 3535 for plastics film, provided the goods are carried as a full load or the bags secured on pallets, or

(c) flexible IBCs conforming to marginal 3623 with the exception of types 13H1, 13L1 and 13M1, provided that carriage is limited to full loads.

2508 (1) Substances classified under (c) of the various items of marginal 2501 shall be packed in:

(a) steel drums conforming to marginal 3520, or

(b) aluminium drums conforming to marginal 3521, or

(c) steel jerricans conforming to marginal 3522, or

(d) plastics drums or plastics jerricans conforming to marginal 3526, or

(e) composite packagings (plastics material) conforming to marginal 3537, or

(f) combination packagings conforming to marginal 3538, or

(g) composite packagings (glass, porcelain or stoneware) conforming to marginal 3539, or

(h) light gauge metal packagings conforming to marginal 3540, or

(i) metal IBCs conforming to marginal 3622, or

(j) rigid plastics IBCs conforming to marginal 3624, or

(k) composite IBCs with plastics inner receptacle conforming to marginal 3625, with the exception of types 11HZ2 and 31HZ2.

NOTE to (a), (b), (c), (d) and (h): Simplified conditions are applicable to removable head drums, jerricans and light gauge metal packagings for viscous substances having a viscosity of more than 200 mm^2/s at 23° C and for solid substances (see marginals 3512, 3552 to 3554 and 3560).

2508 (cont'd) (2) Solid substances within the meaning of marginal 2500(10) may also be packed in:

(a) drums conforming to marginal 3523 for plywood or 3525 for fibreboard, if necessary with one or more sift proof inner bags, or

(b) sift proof bags conforming to marginals 3533 for textile material, 3534 for woven plastics material or 3535 for plastics film or 3536 for water resistant paper, or

(c) flexible intermediate bulk containers (IBCs) with the exception of types 13H1, 13L1 and 13M1, conforming to marginal 3623. Substances of 21° and 22° (c) may be carried in all types of flexible IBCs conforming to marginal 3623.

2509 Packagings or IBCs containing substances of 1°(b) or 1°(c) shall be fitted with a vent conforming to marginal 3500(8) or 3601(6) respectively.

2510

3. Mixed packing

2511 (1) Substances covered by the same item number may be packed together in a combination packaging conforming to marginal 3538.

(2) Substances of different items of this Class in quantities not exceeding, per receptacle, 3 litres for liquids and/or 5kg for solids, may be packed together and/or with goods not subject to the provisions of ADR, in a combination packaging conforming to marginal 3538 provided they do not react dangerously with one another.

(3) Except as otherwise specially provided under paragraph (7), substances of this Class, in quantities not exceeding, per receptacle, 3 litres for liquids and/or 5kg for solids, may be packed together in a combination packaging conforming to marginal 3538, with substances or articles of other classes, provided that mixed packing is also permitted for the substances and articles of these Classes, and/or with goods which are not subject to the provisions of ADR, provided they do not react dangerously with one another.

(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 provisions of marginals 2001(7), 2002(6) and (7) and 2502 shall be complied with.

(6) If wooden or fibreboard boxes are used, a package shall not weigh more than 100 kg.

2511 (cont'd) (7) For substances of 1°(a), 2°, 4°, 5°, 11°, 12°, 13°, 14°, 16°(b), 17°, 25° and 27° to 32° and substances classified under (a) in the remaining items, mixed packing is not allowed. However, for perchloric acid with more than 50% acid of 3°(a), mixed packing is permitted with perchloric acid of Class 8, marginal 2801, 4°(b).

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

Danger labels

2512 (1) Packages containing substances of Class 5.1 shall bear a label conforming to model No. 5.1.

(2) Packages containing substances of 2°, 5°, 29° or 30° shall in addition bear a label conforming to model No. 6.1. Packages containing substances of 1°(a), 1°(b), 3°(a), 5°, 31° or 32° shall in addition bear a label conforming to model No. 8.

(3) Packages containing fragile receptacles not visible from the outside shall bear on two lateral opposite sides a label conforming to model No. 12.

(4) Packages containing liquid substances in receptacles, the closures of which are not visible from the outside, as well as packages containing vented receptacles or vented receptacles without outer packaging, shall bear on two opposite sides a label conforming to model No. 11.

2513

B. Particulars in the transport document

2514 The description of the goods in the transport document shall conform to one of the identification numbers and one of the names underlined in marginal 2501.

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 identification number and the n.o.s. designation, followed by the chemical or technical name of substance 1/.

The description of the goods shall be followed by particulars of the class, the item number, the letter and the initials "ADR" (or "RID"), e.g."5.1, 11°(b), ADR".

For the carriage of wastes (see marginal 2000(4)) the description of the goods shall be: "Waste, containing ...", the component(s) used for the classification of the waste under marginal 2002(8) to be entered under its/their chemical name(s) e.g. "Waste earth containing 1513 zinc chlorate, 5.1, 11°(b), ADR".

For the carriage of solutions and mixtures (such as preparations and wastes) containing several components subject to the provisions of ADR, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures.

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.

2514 (cont'd) If a named substance in accordance with marginal 2500(9), is not subject to the conditions of this Class, the consignor may enter in the transport document: "Not goods of Class 5.1".

2515-2521

C. Empty packagings

2522 (1) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), of 41° shall be closed in the same manner and with the same degree of leakproofness as if they were full.

(2) Uncleaned empty packagings, including empty intermediate bulk containers (IBCs), of 41° 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 underlined in 41°, e.g. Empty packagings, 5.1, 41°, ADR. In the case of empty tank-vehicles, empty demountable tanks, empty tank containers and empty small bulk containers, uncleaned, this description shall be completed by adding the words "Last load" together with the name and item number of the goods last loaded, e.g. "Last load: 2015 hydrogen peroxide, inhibited 1° (a)".

2523-2524

D. Transitional measures

2525 Substances of Class 5.1 may be carried until 30 June 1993 in accordance with the requirements for Class 5.1 applicable until 31 December 1992. The transport document shall, in such cases, bear the inscription: "Carriage in accordance with the ADR in force before 1 January 1993".

2526-2549

CLASSE 5.2 ORGANIC PEROXIDES

1. List of substances

2550 (1) Among the substances and articles covered by the title of Class 5.2, only those which are listed in marginal 2551 or are covered by a collective heading of that marginal are subject to the conditions set out in marginals 2550(4) to 2567 and to the provisions of this Annex and of Annex B. They are then considered as substances and articles of ADR[1].

Note. For the classification of solutions and mixtures (such as preparations and wastes), see also marginal 2002(8).

2550 (cont'd) (2) Organic peroxides and formulations of organic peroxides are not considered to be substances of Class 5.2, if:

- they contain not more than 1.0% available oxygen from the organic peroxides when containing not more than 1.0% hydrogen peroxide;

- they contain not more than 0.5% available oxygen from the organic peroxides when containing more than 1.0% but not more than 7.0% hydrogen peroxide; or

- tests have proved that they are of type G (see paragraph (6)).

Note. The available oxygen content (%) of an organic peroxide formulation is given by the formula $16 \times \Sigma (n_i \times c_i/m_i)$ where:

n_i = number of peroxygen groups per molecule of organic peroxide i;

c_i = concentration (mass %) of organic peroxide i; and

m_i = molecular mass of organic peroxide i.

(3) The following organic peroxides shall not be permitted for carriage under the provisions of Class 5.2:

- organic peroxides type A (see Appendix A.1, marginal 3104(2)(a)).

Definition

(4) Class 5.2 covers organic substances which contain the bivalent -O-O- structure and may be considered derivatives of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals.

Properties

(5) Organic peroxides are thermally unstable substances which are liable to exothermic self-accelerating decomposition at normal or elevated temperatures. The decomposition can be initiated by heat, contact with impurities (e.g. acids, heavy-metal compounds, amines), friction or impact. The rate of decomposition increases with temperature and varies with the organic peroxide formulation. Decomposition may result in the evolution of harmful, or flammable, gases or vapours. Some organic peroxides may decompose explosively, particularly if confined. This characteristic may be modified by the addition of diluents or by the use of appropriate packagings. Many organic peroxides burn vigorously. Contact of organic peroxides with the eyes shall be avoided. Some organic peroxides will cause serious injury to the cornea, even after brief contact, or will be corrosive to the skin.

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(1) For the quantities of substances listed in marginal 2551 which are not subject to the provisions for this Class, either in this Annex or in Annex B, see marginal 2551a.

Classification of organic peroxides

2550 (cont'd) (6) Organic peroxides are classified into seven types according to the degree of danger. The principles to be applied to the classification of substances not listed in marginal 2551 are set out in Appendix A.1, marginal 3104. The types of organic peroxide range from type A, which is not accepted for carriage in the packaging in which it is tested, to type G, which is not subject to the provisions of Class 5.2 (see marginal 2561(5)). The classification of types B to F is directly related to the maximum quantity allowed in one packaging.

(7) Organic peroxides and formulations of organic peroxides listed in marginal 2551 are assigned to collective headings:

- 1° to 20°, identification numbers 3101 to 3120.

The collective headings specify:

- the type (B to F) of organic peroxide, see paragraph (6);
- physical state (liquid / solid), see marginal 2553(1); and
- temperature control (when required), see paragraphs (16) to (19).

(8) Classification of organic peroxides or formulations of organic peroxides not listed in marginal 2551 and assignment to a collective heading shall be made by the competent authority of the country of origin. If the country of origin is not a party to ADR, the classification and conditions of carriage shall be recognized by the competent authority of the first ADR country reached by the consignment.

(9) Samples of organic peroxides or formulations of organic peroxides not listed in marginal 2551, for which a complete set of test results is not available and which are to be carried for further testing or evaluation, shall be assigned to one of the appropriate entries for organic peroxides type C provided the following conditions are met:

- the available data indicate that the sample would be no more dangerous than organic peroxides type B;
- the sample is packaged in accordance with packing method OP2A or OP2B and the quantity per transport unit is limited to 10 kg;
- the available data indicate that the control temperature, if any, is sufficiently low to prevent any dangerous decomposition and sufficiently high to prevent any dangerous phase separation.

Desensitization of organic peroxides

(10) In order to ensure safety during carriage, organic peroxides are in many cases desensitized by organic liquids or solids, inorganic solids or water. Where a percentage of a substance is stipulated, this refers to the percentage by mass, rounded to the nearest whole number. In general, desensitization shall be such that, in case of spillage, the organic peroxide will not concentrate to a dangerous extent.

2550 (cont'd) (11) Unless otherwise stated for the individual organic peroxide formulation, the following definition(s) shall apply to diluents used for desensitization:

- diluents type A are organic liquids which are compatible with the organic peroxide and which have a boiling point of not less than 150°C. Type A diluents may be used for desensitizing all organic peroxides.

- diluents type B are organic liquids which are compatible with the organic peroxide and which have a boiling point of less than 150°C but not less than 60°C and a flash-point of not less than 5°C;

Type B diluents may only be used for desensitization of organic peroxides for which temperature control is required. The boiling point of the liquid shall be at least 50°C higher than the control temperature of the organic peroxide.

(12) Diluents, other than type A or B, may be added to organic peroxide formulations as listed in marginal 2551 provided that they are compatible and do not change the classification.

(13) Water may only be used for the desensitization of organic peroxides which are listed in marginal 2551 or in the competent authority decision according to paragraph (8) as being "with water" or "as a stable dispersion in water ". Samples of organic peroxides or formulations of organic peroxides not listed in marginal 2551 may also be desensitised with water provided the requirements of paragraph (9) are met.

(14) Organic and inorganic solids may be used for desensitization of organic peroxides provided that they are compatible.

(15) Compatible liquids and solids are those which have no detrimental influence on the thermal stability and hazard type of the organic peroxide formulation.

Temperature control provisions

(16) Certain organic peroxides may only be carried under temperature-controlled conditions. The control temperature is the maximum temperature at which the organic peroxide can be safely carried. It is assumed that the temperature of the immediate surroundings of a package only exceeds 55°C during carriage for a relatively short time in a 24 hour period. In the event of loss of temperature control, it may be necessary to implement emergency procedures. The emergency temperature is the temperature at which such procedures shall be implemented.

(17) The control and emergency temperatures are derived from the self-accelerating decomposition temperature (SADT) which is defined as the lowest temperature at which self-accelerating decomposition may occur with a substance in the packaging as used during carriage (see Table 1). The SADT shall be determined in order to decide whether a substance shall be subjected to temperature control during carriage. Provisions for the determination of the SADT are given in Appendix A.1, marginal 3103.

2550 (cont'd)

Table 1 Derivation of control and emergency temperatures

SADT	Control temperature	Emergency temperature
20°C or less	20°C below SADT	10°C below SADT
over 20°C to 35°C	15°C below SADT	10°C below SADT
over 35°C	10°C below SADT	5°C below SADT

(18) The following organic peroxides shall be subject to temperature control during carriage:

- organic peroxides types B and C with an SADT ≤ 50°C;
- organic peroxides type D showing a violent or medium effect when heated under confinement with an SADT ≤ 50°C or showing a low or no effect when heated under confinement with an SADT ≤ 45°C; and
- organic peroxides types E and F with an SADT ≤ 45°C.

Note. Provisions for the determination of the effects of heating under confinement are given in Appendix A.1, marginal 3103.

(19) Where applicable, control and emergency temperatures are listed in marginal 2551. The actual temperature during carriage may be lower than the control temperature but shall be selected so as to avoid dangerous separation of phases.

2551 A. Organic peroxides not requiring temperature control.

1°(b) 3101 organic peroxide type B, liquid, such as:

Substance	Concentration (%)	Diluent type A (%)	Packing method (see marg. 2554)	Additional labelling (see marg. 2559)
tert-Amyl peroxy-3,5,5-trimethylhexanoate	≤ 100		OP5A	01
tert-Butyl peroxyacetate	53 - 77	≥ 23	OP5A	01
1,1-Di-(tert-butylperoxy)cyclohexane	81 - 100		OP5A	01
1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane	58 - 100		OP5A	01
Methyl ethyl ketone peroxide(s)[1]	≤ 52	≥ 48	OP5A	01, 8

(1) Available oxygen > 10.0 %

2551 (cont'd)

2°(b) 3102 organic peroxide type B, solid, such as:

Substance	Concentration (%)	Inert solid (%)	Water (%)	Packing method (see marg. 2554)	Additional labelling (see marg. 2559)
tert-Butyl monoperoxymaleate	53 - 100			OP5B	01
tert-Butyl monoperoxyphthalate	≤ 100			OP5B	01
3-Chloroperoxybenzoic acid	58 - 86	≥ 14		OP1B	01
Dibenzoyl peroxide	52 - 100	≤ 48		OP2B	01
Dibenzoyl peroxide	78 - 94		≥ 6	OP4B	01
Di-4-chlorobenzoyl peroxide	≤ 77		≥ 23	OP5B	01
Di-2,4-dichlorobenzoyl peroxide	≤ 77		≥ 23	OP5B	01
2,2-Dihydroperoxypropane	≤ 27	≥ 73		OP5B	01
2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane	83 - 100			OP5B	01
Di-(2-phenoxyethyl) peroxydicarbonate	86 - 100			OP5B	01
Disuccinic acid peroxide[1]	73 - 100			OP4B	01
3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane	53 - 100			OP4B	01

(1) Addition of water will decrease the thermal stability

3°(b) 3103 organic peroxide type C, liquid, such as:

Substance	Concentration (%)	Diluent type A (%)	Water (%)	Packing method (see marg. 2554)	Additional labelling (see marg. 2559)
n-Butyl-4,4-di-(tert-butylperoxy)valerate	53 - 100			OP5A	
tert-Butyl hydroperoxide	73 - 90		≥ 10	OP5A	8
tert-Butyl hydroperoxide + di-tert-butyl peroxide	≤ 82 + ≥ 9		≥ 7	OP5A	8
tert-Butyl monoperoxymaleate	≤ 52	≥ 48		OP6A	
tert-Butyl peroxyacetate	≤ 52	≥ 48		OP6A	
tert-Butyl peroxybenzoate	78 - 100	≤ 22		OP5A	
tert-Butylperoxy isopropylcarbonate	≤ 77	≥ 23		OP5A	
2,2-Di-(tert-butylperoxy)butane	≤ 52	≥ 48		OP6A	
1,1-Di-(tert-butylperoxy)cyclohexane	53 - 80	≥ 20		OP5A	
2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexyne-3	53 - 100			OP5A	
Ethyl 3,3-di-(tert-butylperoxy)butyrate	78 - 100			OP5A	
Organic peroxide, liquid, sample[1]				OP2A	

(1) See marginal 2550(9)

4°(b) 3104 organic peroxide type C, solid, such as:

Substance	Concentration (%)	Water (%)	Packing method (see marg. 2554)	Additional labelling (see marg. 2559)
Cycloheranone peroxide(s)	≤ 91	≥ 9	OP6B	8
Dibenzoyl peroxide	≤ 77	≥ 23	OP6B	
2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane	≤ 82	≥ 18	OP5B	
2,5-Dimethyl-2,5-dihydroperoxyhexane	≤ 82	≥ 18	OP6B	
Organic peroxide, solid, sample[1]			OP2B	

(1) See marginal 2550(9)

2551 (cont'd)

5°(b) 3105 organic peroxide type D, liquid, such as:

Substance	Concentration (%)	Diluent type A (%)	Water (%)	Packing method (see marg. 2554)	Additional labelling (see marg. 2559)
Acetyl acetone peroxide[1]	≤ 42	≥ 48	≥ 8	OP7A	
Acetyl benzoyl peroxide	≤ 45	≥ 55		OP7A	
tert-Amyl peroxybenzoate	≤ 96	≥ 4		OP7A	
tert-Butyl cumylperoxide	≤ 100			OP7A	
tert-Butyl hydroperoxide[2]	≤ 80	≥ 20		OP7A	8
tert-Butyl peroxybenzoate	53 - 77	≥ 23		OP7A	
tert-Butyl peroxycrotonate	≤ 77	≥ 23		OP7A	
tert-Butyl peroxydiethylacetate + tert-butyl peroxybenzoate	≤ 33 + ≤ 33	≥ 33		OP7A	
tert-Butyl peroxy-3,5,5-trimethylhexanoate	≤ 100			OP7A	
Cyclohexanone peroxide(s)[3]	≤ 72	≥ 28		OP7A	
1,1-Di-(tert-butylperoxy)cyclohexane	≤ 52	≥ 48		OP7A	
Di-(tert-butylperoxy)phthalate	43 - 52	≥ 48		OP7A	
2,2-Di-(tert-butylperoxy)propane	≤ 52	≥ 48		OP7A	
2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane	53 - 100			OP7A	
2,5-Dimethyl-2,5-di-(3,5,5-trimethylhexanoyl-peroxy)hexane	≤ 77	≥ 23		OP7A	
Ethyl 3,3-di-(tert-amylperoxy)butyrate	≤ 67	≥ 33		OP7A	
Ethyl 3,3-di-(tert-butylperoxy)butyrate	≤ 77	≥ 23		OP7A	
3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane	≤ 52	≥ 48		OP7A	
p-Menthyl hydroperoxide	56 - 100			OP7A	8
Methyl ethyl ketone peroxide(s)[4]	≤ 45	≥ 55		OP7A	
Methyl isobutyl ketone peroxide(s)[5]	≤ 62	≥ 19		OP7A	
Peroxyacetic acid, type D, stabilized[6]	≤ 43			OP7A	8
Pinanyl hydroperoxide	56 - 100			OP7A	8
1,1,3,3-Tetramethylbutyl hydroperoxide	≤ 100			OP7A	

(1) Available oxygen ≤ 4.7 %
(2) Diluent may be replaced by di-tert-butyl peroxide
(3) Available oxygen ≤ 9.0 %
(4) Available oxygen ≤ 10.0 %
(5) With ≥ 19 % methyl isobutyl ketone in addition to diluent type A
(6) Mixtures of peroxyacetic acid with hydrogen peroxide, water and acids which fulfil the criteria of Appendix A.1, marginal 3104(2)(d)

2551 (cont'd) 6°(b) 3106 organic peroxide type D, solid, such as:

Substance	Concentration (%)	Diluent type A (%)	Inert solid (%)	Water (%)	Packing method (see marg. 2554)
Acetyl acetone peroxide[1] as a paste	≤ 32				OP7B
n-Butyl-4,4-di-(tert-butylperoxy)valerate	≤ 52		≥ 48		OP7B
tert-Butyl peroxybenzoate	≤ 52		≥ 48		OP7B
tert-Butyl peroxy-2-ethylhexanoate + 2,2-di-(tert-butylperoxy)butane	≤ 12 + ≤ 14	≥ 14	≥ 60		OP7B
3-tert-Butylperoxy-3-phenylphthalide	≤ 100				OP7B
tert-Butylperoxy stearylcarbonate	≤ 100				OP7B
3-Chloroperoxybenzoic acid	≤ 57		≥ 3	≥ 40	OP7B
Cyclohexanone peroxide(s)[1],[2] as a paste	≤ 72				OP7B
Dibenzoyl peroxide	≤ 62		≥ 28	≥ 10	OP7B
Dibenzoyl peroxide[1] as a paste	53 - 62				OP7B
Dibenzoyl peroxide	36 - 52		≥ 48		OP7B
1,1-Di-(tert-butylperoxy)cyclohexane	≤ 42	≥ 13	≥ 45		OP7B
2,2-Di-(4,4-tert-butylperoxycyclohexyl)propane	≤ 42		≥ 58		OP7B
Di-(2-tert-butylperoxyisopropyl)benzene(s)	43 - 100		≤ 57		OP7B
Di-(tert-butylperoxy)phthalate[1],[2] as a paste	≤ 52				OP7B
2,2-Di-(tert-butylperoxy)propane	≤ 42	≥ 13	≥ 45		OP7B
1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane	≤ 57		≥ 43		OP7B
Di-4-chlorobenzoyl peroxide[1] as a paste	≤ 52				OP7B
Di-2,4-dichlorobenzoyl peroxide, as a paste with silicon oil	≤ 52				OP7B
Di-(1-hydroxycyclohexyl) peroxide	≤ 100				OP7B
Dilauroyl peroxide	≤ 100				OP7B
2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane	≤ 82		≥ 18		OP7B
2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane	≤ 52		≥ 48		OP7B
2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexyne-3	≤ 52		≥ 48		OP7B
Di-(2-phenoxyethyl) peroxydicarbonate	≤ 85			≥ 15	OP7B
Distearyl peroxydicarbonate	≤ 87		≥ 13		OP7B
Ethyl 3,3-di-(tert-butylperoxy)butyrate	≤ 52		≥ 48		OP7B
3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane	≤ 52		≥ 48		OP7B
Tetrahydronaphthyl hydroperoxide	≤ 100				OP7B

(1) With diluent type A, with or without water
(2) Available oxygen ≤ 9.0 %

7°(b) 3107 organic peroxide type E, liquid, such as:

Substance	Concentration (%)	Diluent type A (%)	Water (%)	Packing method (see marg. 2554)	Additional labelling (see marg. 2559)
tert-Amyl hydroperoxide	≤ 88	≥ 6	≥ 6	OP8A	
Di-tert-amyl peroxide	≤ 100			OP8A	
Di-tert-butyl peroxide	≤ 100			OP8A	
1,1-Di-(tert-butylperoxy)cyclohexane[1]	≤ 27	≥ 36		OP8A	
Di-(tert-butylperoxy)phthalate	≤ 42	≥ 58		OP8A	
1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane	≤ 57	≥ 43		OP8A	
Methyl ethyl ketone peroxide(s)[2]	≤ 40	≥ 60		OP8A	
Peroxyacetic acid, type E, stabilized[3]	≤ 43			OP8A	S

(1) With ≥ 36% ethylbenzene in addition to diluent type A
(2) Available oxygen ≤ 8.2 %
(3) Mixtures of peroxyacetic acid with hydrogen peroxide, water and acids which fulfil the criteria of Appendix A.I, marginal 3104(2)(e)

2551 (cont'd) 8°(b) 3108 organic peroxide type E, solid, such as:

Substance	Concentration (%)	Packing method (see marg. 2554)
tert-Butyl monoperoxymaleate[1] as a paste	≤ 42	OP8B
Dibenzoyl peroxide[1] as a paste	≤ 52	OP8B

(1) With diluent type A, with or without water

9°(b) 3109 organic peroxide type F, liquid, such as:

Substance	Concentration (%)	Diluent type A (%)	Water (%)	Packing method (see marg. 2554)	Additional labelling (see marg. 2559)
tert-Butyl hydroperoxide	≤ 72		≥ 28	OP8A	8
Cumyl hydroperoxide	80 - 90	≥ 10		OP8A	8
Cumyl hydroperoxide	< 80	≥ 20		OP8A	
Dilauroyl peroxide as a stable dispersion in water	≤ 42			OP8A	
Isopropylcumyl hydroperoxide	≤ 72	≥ 28		OP8A	8
p-Menthyl hydroperoxide	≤ 55	≥ 45		OP8A	
Peroxyacetic acid, type F, stabilized (1)	≤ 43			OP8A	8
Pinanyl hydroperoxide	≤ 55	≥ 45		OP8A	

(1) Mixtures of peroxyacetic acid with hydrogen peroxide, water and acids which fulfil the criteria of Appendix A.1, marginal 3104(2)(f)

10°(b) 3110 organic peroxide type F, solid, such as:

Substance	Concentration (%)	Inert solid (%)	Packing method (see marg. 2554)
Dicumyl peroxide	43 - 100	≤ 57	OP8B

2551 (cont'd)

B. Organic peroxides requiring temperature control.

Note. Substances of 11° to 20° are organic peroxides which decompose easily at normal temperatures and shall therefore be carried only under conditions of adequate refrigeration. For these organic peroxides, the maximum temperature during carriage shall not exceed the control temperature indicated.

11°(b) 3111 organic peroxide type B, liquid, temperature controlled, such as:

Substance	Concentration (%)	Diluent type A or B (%)	Packing method (see marg. 2554)	Control temperature (°C)	Emergency temperature (°C)	Additional labelling (see marg. 2559)
tert-Butyl peroxyisobutyrate	53 - 77	≥ 23	OP5A	+ 15	+ 20	01
Diisobutyryl peroxide	33 - 52	≥ 48	OP5A	- 20	- 10	01

12°(b) 3112 organic peroxide type B, solid, temperature controlled, such as:

Substance	Concentration (%)	Water (%)	Packing method (see marg. 2554)	Control temperature (°C)	Emergency temperature (°C)	Additional labelling (see marg. 2559)
Acetyl cyclohexanesulphonyl peroxide	≤ 82	≥ 12	OP4B	- 10	0	01
Dibenzyl peroxydicarbonate	≤ 87	≥ 13	OP5B	+ 25	+ 30	01
Dicyclohexyl peroxydicarbonate	92 - 100		OP5B	+ 5	+ 10	01
Diisopropyl peroxydicarbonate	53 - 100		OP2B	- 15	- 5	01
Di-(2-methylbenzoyl) peroxide	≤ 87	≥ 13	OP5B	+ 30	+ 35	01

13°(b) 3113 organic peroxide type C, liquid, temperature controlled, such as:

Substance	Concentration (%)	Diluent type A or B (%)	Packing method (see marg. 2554)	Control temperature (°C)	Emergency temperature (°C)
tert-Amyl peroxypivalate	≤ 77	≥ 23	OP5A	+ 10	+ 15
tert-Butyl peroxydiethylacetate	≤ 100		OP5A	+ 20	+ 25
tert-Butyl peroxy-2-ethylhexanoate	53 - 100		OP6A	+ 20	+ 25
tert-Butyl peroxypivalate	68 - 77	≥ 23(1)	OP5A	0	+ 10
Di-sec-butyl peroxydicarbonate	53 - 100		OP4A	- 20	- 10
Di-(2-ethylhexyl) peroxydicarbonate	78 - 100		OP5A	- 20	- 10
Di-n-propyl peroxydicarbonate	≤ 100		OP4A	- 25	- 15
Organic peroxide, liquid, sample, temperature controlled(2)			OP2A		

(1) Only diluent type A shall be used
(2) See marginal 2550(9)

2551 (cont'd) 14°(b) 3114 organic peroxide type C, solid, temperature controlled, such as:

Substance	Concentration (%)	Water (%)	Packing method (see marg. 2554)	Control temperature (°C)	Emergency temperature (°C)
Di-(4-tert-butylcyclohexyl) peroxydicarbonate	≤ 100		OP6B	+ 30	+ 35
Dicyclohexyl peroxydicarbonate	≤ 91	≥ 9	OP3B	+ 5	+ 10
Didecanoyl peroxide	≤ 100		OP6B	+ 15	+ 20
Di-n-octanoyl peroxide	≤ 100		OP5B	+ 10	+ 15
Organic peroxide, solid, sample, temperature controlled[1]			OP2B		

(1) See marginal 2550(9)

15°(b) 3115 organic peroxide type D, liquid, temperature controlled, such as:

Substance	Concentration (%)	Diluent type A or B (%)	Water (%)	Packing method (see marg. 2554)	Control temperature (°C)	Emergency temperature (°C)	Additional labelling (see marg. 2558)
Acetyl cyclohexanesulphonyl peroxide	≤ 32	≥ 68		OP7A	- 10	0	
tert-Amyl peroxy-2-ethylhexanoate	100			OP7A	+ 20	+ 25	
tert-Amyl peroxyneodecanoate	≤ 77	≥ 23		OP7A	0	+ 10	
tert-Butyl peroxy-2-ethylhexanoate + 2,2-di-(tert-butylperoxy)butane	≤ 31 + ≤ 36	≥ 33		OP7A	+ 35	+ 40	
tert-Butyl peroxyisobutyrate	≤ 52	≥ 48		OP7A	+ 15	+ 20	
tert-Butyl peroxyneodecanoate	78 - 100			OP7A	- 5	+ 5	
tert-Butyl peroxyneodecanoate	≤ 77	≥ 23		OP7A	0	+ 10	
tert-Butyl peroxypivalate	≤ 67	≥ 33		OP7A	0	+ 10	
Cumyl peroxyneodecanoate	≤ 77	≥ 23		OP7A	- 10	0	
Cumyl peroxypivalate	≤ 77	≥ 23		OP7A	- 5	+ 5	
Diacetone alcohol peroxides[1]	≤ 57	≥ 26	≥ 8	OP7A	+ 30	+ 35	
Diacetyl peroxide[2]	≤ 27	≥ 73		OP7A	+ 20	+ 25	8
Di-n-butyl peroxydicarbonate	28 - 52	≥ 48		OP7A	- 15	- 5	
Di-sec-butyl peroxydicarbonate	≤ 52	≥ 48		OP7A	- 15	- 5	
Di-(2-ethylhexyl) peroxydicarbonate	≤ 77	≥ 23		OP7A	- 15	- 5	
Diethyl peroxydicarbonate	≤ 27	≥ 73		OP7A	- 10	0	
Diisobutyryl peroxide	≤ 32	≥ 68		OP7A	- 20	- 10	
Diisopropyl peroxydicarbonate	≤ 52	≥ 48		OP7A	- 10	0	
Diisotridecyl peroxydicarbonate	100			OP7A	- 10	0	
2,5-Dimethyl-2,5-di-(2-ethylhexanoylperoxy)hexane	100			OP7A	+ 20	+ 25	
Di-(3,5,5-trimethyl-hexanoyl) peroxide	≤ 82	≥ 18[3]		OP7A	0	+ 10	
Methylcyclohexanone peroxide(s)	≤ 67	≥ 33		OP7A	+ 35	+ 40	
1,1,3,3-Tetramethylbutyl peroxy-2-ethylhexanoate	100			OP7A	+ 20	+ 25	
2,4,4-Trimethylpentyl-2-peroxy phenoxyacetate	≤ 37	≥ 63		OP7A	- 10	0	

(1) With ≤ 9 % hydrogen peroxide; available oxygen ≤ 10.0 %
(2) Only non-metallic packagings shall be used
(3) Only diluent type A shall be used

2551 (cont'd) 16°(b) 3116 organic peroxide type D, solid, temperature controlled, such as:

Substance	Concentration (%)	Inert solid (%)	Water (%)	Packing method (see marg. 2554)	Control temperature (°C)	Emergency temperature (°C)
Dicetyl peroxydicarbonate	≤ 100			OP7B	+ 20	+ 25
Dimyristyl peroxydicarbonate	≤ 100			OP7B	+ 20	+ 25
Di-n-nonanoyl peroxide	≤ 100			OP7B	0	+ 10
Diperoxy sebacic acid	≤ 27	≥ 73		OP7B	+ 35	+ 40
Diperoxy dodecane diacid	14 - 42	≥ 58		OP7B	+ 40	+ 45
Disuccinic acid peroxide	≤ 72		≥ 28	OP7B	+ 10	+ 15
Di-(3,5,5-trimethyl-1,2-dioxolanyl-3) peroxide[1] as a paste	≤ 52			OP7B	+ 30	+ 35

(1) With diluent type A, with or without water

17°(b) 3117 organic peroxide type E, liquid, temperature controlled, such as:

Substance	Concentration (%)	Diluent type A or B (%)	Packing method (see marg. 2554)	Control temperature (°C)	Emergency temperature (°C)
tert-Butyl peroxy-2-ethylhexanoate	≤ 52	≥ 48	OP8A	+ 20	+ 25
Di-n-butyl peroxydicarbonate	≤ 27	≥ 73	OP8A	- 10	0
Di -(2-ethylhexyl) peroxy dicarbonate as a stable dispersion in water	≤ 42		OP8A	- 15	- 5
Dipropionyl peroxide	≤ 27	≥ 73	OP8A	+ 15	+ 20

18°(b) 3118 organic peroxide type E, solid, temperature controlled, such as:

Substance	Concentration (%)	Packing method (see marg. 2554)	Control temperature (°C)	Emergency temperature (°C)
Di-(2-ethylhexyl) peroxy-dicarbonate as a stable dispersion in water (frozen)	≤ 42	OP8B	- 15	- 5

19°(b) 3119 organic peroxide type F, liquid, temperature controlled, such as:

Substance	Concentration (%)	Packing method (see marg. 2554)	Control temperature (°C)	Emergency temperature (°C)
Di-(4-tert-butylcyclohexyl) peroxydicarbonate as a stable dispersion in water	≤ 42	OP8A	+ 30	+ 35
Dicetyl peroxydicarbonate as a stable dispersion in water	≤ 42	OP8A	+ 30	+ 35
Dimyristyl peroxydicarbonate as a stable dispersion in water	≤ 42	OP8A	+ 20	+ 25

2551 (cont'd) 20°(b) 3120 organic peroxide type F, solid, temperature controlled

No organic peroxides are currently included under this item.

C. Empty packagings

31° Empty packagings, including empty intermediate bulk containers (IBCs), empty tank-vehicles, empty demountable tanks and empty tank-containers, uncleaned, having contained substances of Class 5.2.

2551a Test or repair kits, or other articles, containing small quantities of substances indicated below, carried in conformity with the following provisions, are not subject to the provisions for this Class contained in this Annex or in Annex B:

(a) liquids of 1°, 3°, 5°, 7° or 9°: not more than 25 ml per inner packaging;

(b) solids of 2°, 4°, 6°, 8° or 10°: not more than 100 g per inner packaging.

These quantities of substances shall be carried in combination packagings which at least meet the conditions of marginal 3538. The total gross mass of the package shall not exceed 30 kg. These quantities of substances may be packed together with other articles or substances provided that they will not interact dangerously in the event of leakage.

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.

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

2. Provisions

A. Packages

1. General conditions of packing

2552 (1) Packagings shall satisfy the conditions of Appendix A.5 and shall be so constructed that none of the materials which are in contact with the contents will dangerously affect the contents. The degree of filling shall not exceed 93%. For combination packagings, cushioning materials shall not be readily combustible and shall not cause decomposition of the organic peroxide if leakage occurs.

(2) Intermediate bulk containers (IBCs) shall satisfy the conditions of Appendix A.6.

(3) In accordance with the provisions of marginals 3511(2) or 3611(2), packagings of packing groups II or I marked with the letter "Y" or "X" or IBCs of packing group II, marked with the letter "Y", shall be used. Metal packagings of packing group I, however, shall not be used.

2552 (cont'd) Note. For the carriage of substances of Class 5.2 in tank vehicles, demountable tanks or tank-containers, see Annex B.

2. Special conditions for packing of certain substances and articles

2553 (1) The packing methods for substances of Class 5.2 are listed in Table 2 and are designated OP1A to OP8A for liquids and OP1B to OP8B for solids. Viscous substances with an outflow time from a DIN-CUP with 4 mm Ø outlet at 20°C exceeding 10 minutes (corresponding to an outflow time of more than 690 seconds at 20°C from a Ford cup 4, or to more than 2.68×10^{-3} m^2/s) shall be considered as solids.

(2) Substances and articles shall be packed as indicated in marginal 2551 and as set out in detail in Table 2(A) and 2(B). A packing method for a package of a smaller size (i.e. with a lower OP number) may be used; this provision is not applicable, however, to a packing method for a package of a larger size (i.e. with a higher OP number).

(3) Packages bearing a label conforming to model No. 01 shall comply with the provisions of marginal 2102(4) and (6).

2554 (1) For organic peroxides or formulations of organic peroxides not listed in marginal 2551, the following procedure shall be used to assign the appropriate packing method:

(a) organic peroxides type B:
Substances and articles shall be assigned packing method OP5A or OP5B provided that they satisfy the criteria of Appendix A.1, marginal 3104(2)(b) in one of the packagings indicated. If the organic peroxide can only satisfy these criteria in a smaller packaging than those listed for packing method OP5A or OP5B (i.e. one of the packagings listed for OP1A to OP4A or OP1B to OP4B), then the corresponding packing method with the lower OP number shall be assigned.

(b) organic peroxides type C:
Substances and articles shall be assigned packing method OP6A or OP6B provided that they satisfy the criteria of Appendix A.1, marginal 3104(2)(c) in one of the packagings indicated. If the organic peroxide can only satisfy these criteria in a smaller packaging than those listed for packing method OP6A or OP6B then the corresponding packing method with the lower OP number shall be assigned.

(c) organic peroxides type D:
Packing method OP7A or OP7B shall be assigned.

(d) organic peroxides type E:
Packing method OP8A or OP8B shall be assigned.

(e) organic peroxides type F:
Packing method OP8A or OP8B shall be assigned.

2554 (2)
(cont'd)

TABLE 2 (A) - LIST OF PACKAGINGS FOR LIQUID ORGANIC PEROXIDES

Type and material	Packaging code (see marginal 3514)	Maximum quantity or net mass per package (1)							
		OP1A (2)	OP2A (2)	OP3A (2)	OP4A (2)	OP5A (2)	OP6A (2)	OP7A	OP8A
Steel drum	1A1	*	*	*	*	*	*	60 litres	225 litres
Steel drum (3)	1A2	*	*	*	*	*	*	50 kg	200 kg
Aluminium drum	1B1	*	*	*	*	*	*	60 litres	225 litres
Fibre drum (3)	1G	0.5 kg	0.5/10 kg	5 kg	5/25 kg	25 kg	50 kg	50 kg	200 kg
Plastics drum	1H1	0.5 litres	0.5 litres	5 litres	5 litres	30 litres	60 litres	60 litres	225 litres
Plastics jerrican	3H1	0.5 litres	0.5 litres	5 litres	5 litres	30 litres	60 litres	60 litres	60 litres
Wooden box (3)	4C1	0.5 kg	0.5/10 kg	5kg	5/25 kg	25 kg	50 kg	50 kg	100 kg
Plywood box (3)	4D	0.5 kg	0.5/10 kg	5kg	5/25 kg	25 kg	50 kg	50 kg	100 kg
Fibreboard box (3)	4G	0.5 kg	0.5/10 kg	5kg	5/25 kg	25 kg	50 kg	50 kg	100 kg
Plastics receptacle with outer steel drum	6HA1	*	*	*	*	*	*	60 litres	225 litres
Plastics receptacle with outer aluminium drum	6HB1	*	*	*	*	*	*	60 litres	225 litres
Plastics receptacle with outer fibre drum	6HG1	0.5 litres	0.5 litres	5 litres	5 litres	30 litres	60 litres	60 litres	225 litres
Plastics receptacle with outer fibreboard box	6HG2	0.5 litres	0.5 litres	5 litres	5 litres	30 litres	60 litres	60 litres	60 litres
Plastics receptacle with outer plastics drum	6HH1	0.5 litres	0.5 litres	5 litres	5 litres	30 litres	60 litres	60 litres	225 litres
Plastics receptacle with outer solid plastics box	6HH2	0.5 litres	0.5 litres	5 litres	5 litres	30 litres	60 litres	60 litres	60 litres

* Prohibited for organic peroxide types B and C.

(1) If two values are given, the first applies to the maximum net mass per inner receptacle and the second to the maximum net mass of the complete package.

(2) For combination packagings containing organic peroxide type B or C, only plastics bottles, plastics jars, glass bottles or glass ampoules may be used as inner packagings. However, glass receptacles may only be used as inner receptacles for packing methods OP1A and OP2A.

(3) These packagings are only allowed as part of a combination packaging. Inner packagings shall be suitable for liquids.

2554 - (3)
(cont'd)

TABLE 2 (B) - LIST OF PACKAGINGS FOR SOLID ORGANIC PEROXIDES

Type and material	Packaging code (see marginal 3514)	Maximum net mass per package (1) OP1B (2)	OP2B (2) (3)	OP3B (2)	OP4B (2)	OP5B (2)	OP6B (2)	OP7B	OP8B
Steel drum	1A2	*	*	*	*	*	*	50 kg	200 kg
Aluminium drum	1B2	*	*	*	*	*	*	50 kg	200 kg
Fibre drum	1G	0.5 kg	0.5/10 kg	5 kg	5/25 kg	25 kg	50 kg	50 kg	200 kg
Plastics drum	1H2	0.5 kg	0.5/10 kg	5 kg	5/25 kg	25 kg	50 kg	50 kg	200 kg
Wooden box (4)	4C1	0.5 kg	0.5/10 kg	5 kg	5/25 kg	25 kg	50 kg	50 kg	100 kg
Plywood box (4)	4D	0.5 kg	0.5/10 kg	5 kg	5/25 kg	25 kg	50 kg	50 kg	100 kg
Fibreboard box (4)	4G	0.5 kg	0.5/10 kg	5 kg	5/25 kg	25 kg	50 kg	50 kg	100 kg
Plastics receptacle with outer steel drum	6HA1	*	*	*	*	*	*	50 kg	200 kg
Plastics receptacle with outer aluminium drum	6HB1	*	*	*	*	*	*	50 kg	200 kg
Plastics receptacle with outer fibre drum	6HG1	0.5 kg	0.5 kg	5 kg	5 kg	25 kg	50 kg	50 kg	200 kg
Plastics receptacle with outer fibreboard box	6HG2	0.5 kg	0.5 kg	5 kg	5 kg	25 kg	50 kg	50 kg	75 kg
Plastics receptacle with outer plastics drum	6HH1	0.5 kg	0.5 kg	5 kg	5 kg	25 kg	50 kg	50 kg	200 kg
Plastics receptacle with outer solid plastics box	6HH2	0.5 kg	0.5 kg	5 kg	5 kg	25 kg	50 kg	50 kg	75 kg

* Prohibited for organic peroxide types B and C.

(1) If two values are given, the first applies to the maximum net mass per inner receptacle and the second to the maximum net mass of the complete package.

(2) For combination packagings containing organic peroxide type B or C, only non-metallic packagings may be used. However, glass receptacles may only be used as inner receptacles for packing methods OP1B and OP2B.

(3) If fire retardant partitions are used, the maximum net mass of the complete package may be 25 kg.

(4) These packagings are only allowed as part of a combination packaging. Inner packagings shall be suitable for the substances to be carried.

2555 (1) The substances of marginal 2551, 9°(b), 10°(b), 19°(b) or 20°(b) may be carried in IBCs under conditions laid down by the competent authority of the country of origin when, on the basis of testing, the competent authority is satisfied that such carriage may be safely conducted. The tests shall include those necessary:

- to prove that the organic peroxide complies with the principles for classification given in Appendix A.1, marginal 3104(2)(f);
- to prove the compatibility with all materials normally in contact with the substance during carriage;
- to determine, when applicable, the control and emergency temperatures associated with the carriage of the substance in the IBC concerned as derived from the SADT;
- to design, when applicable, emergency-relief devices; and
- to determine if any special requirements are necessary.

If the country of origin is not party to ADR, these conditions shall be recognized by the competent authority of the first ADR country reached by the consignment.

(2) The following organic peroxides of type F may be carried in intermediate bulk containers (IBCs) of the type shown, without complying with the conditions of paragraph (1):

Substance	Type of IBC	Maximum capacity (litres)	Control temperature	Emergency temperature
3109 Organic peroxide type F, liquid:				
- dilauroyl peroxide, not more than 42%, stable dispersion, in water	31HA1	1000		
3119 Organic peroxide type F, liquid, temperature controlled:				
- di-(4-tert-butylcyclohexyl) peroxydicarbonate, not more than 42%, stable dispersion, in water	31HA1	1000	+30°C	+35°C
- dicetyl peroxydicarbonate, not more than 42%, stable dispersion, in water	31HA1	1000	+30°C	+35°C
- dimyristyl peroxydicarbonate, not more than 42%, stable dispersion, in water	31HA1	1000	+15°C	+25°C

2555 (3) To prevent explosive rupture of metal intermediate bulk containers (IBCs) or composite IBCs with full wall metal casing, the emergency-relief devices shall be designed to vent all the decomposition products and vapours evolved during a period of not less than one hour of fire engulfment (heat load 110 kW/m^2) or self-accelerating decomposition.

2556-2557 -

3. Mixed packing

2558 Substances of Class 5.2 shall not be packed together with substances or articles of other Classes or with goods which are not subject to the provisions of ADR.

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

2559 (1) Packages containing substances of Class 5.2 shall bear a label conforming to model No. 5.2.

(2) Packages containing organic peroxides of 1°, 2°, 11° and 12° shall in addition bear a label conforming to model No. 01 unless the competent authority has permitted this label to be dispensed with for the type of packaging tested because the results have proved that the organic peroxide in such a packaging does not exhibit explosive behaviour (see marginal 2561(4)).

(3) When a substance is highly corrosive or corrosive according to the criteria of Class 8 (see marginal 2800(1)), packages shall, in addition, bear a label conforming to model No. 8. This is indicated in marginal 2551(additional labelling) or, when required, in the approved conditions of carriage (see marginal 2550(8)).

(4) Packages containing fragile receptacles not visible from the outside shall bear on two opposite sides a label conforming to model No. 12.

(5) Packages containing liquids in packagings the closures of which are not visible from the outside, packages containing vented packagings or vented packagings without outer packagings shall bear on two opposite sides a label conforming to model No. 11.

2560 -

B. Particulars in the transport document

2561 (1) The description of the goods in the transport document shall conform to one of the identification numbers and the corresponding collective heading underlined in marginal 2551 followed by the chemical name (in brackets).

This description shall be followed by particulars of the class, the item number, the letter and the initials "ADR" (or "RID"), e.g..3108, organic peroxide type E, solid, (dibenzoyl peroxide), 5.2, 8°(b), ADR.

For the carriage of wastes (see marginal 2000(4)), the description of the goods shall be: "Waste, containing ....", the component(s) which has/have been used for the classification of the waste under marginal 2002(8) to be entered under its/their chemical name(s) e.g. "Waste, containing 3107 organic peroxide type E, liquid, (peroxyacetic acid), 5.2, 7°(b), ADR". In general, not more than the two components which predominantly contribute to the danger or dangers of the waste need be shown.

(2) When substances and articles are carried under conditions fixed by the competent authority (see marginals 2550(8), 2555(1) and Appendix B1a/B1b 21x 511), the following statement shall be included in the transport document:

"Carriage in accordance with marginal 2561(2)."

A copy of the decision of the competent authority with the conditions of carriage shall be attached to the transport document.

(3) When a sample of an organic peroxide is carried in accordance with marginal 2550(9), the following statement shall be included in the transport document:

"Carriage in accordance with marginal 2561(3)."

(4) When, by permission of the competent authority in accordance with marginal 2559(2), a label conforming to model No.01 is not required, the following statement shall be included in the transport document.

"The danger label conforming to model No. 01 is not required."

(5) When organic peroxides type G (see Appendix A.1 marginal 3104(2)(g) are carried, the following statement may be given in the transport document:

"Not a substance of Class 5.2."

(6) For organic peroxides requiring temperature control during carriage, the following statement shall be given in the transport document:

"Control temperature: ...°C Emergency temperature: °C.

2562-2566

C. Empty packagings

2567 (1) Empty packagings, including empty intermediate bulk containers (IBCs), uncleaned, of 31° shall be closed in the same manner and with the same degree of leakproofness as if they were full.

(2) Empty packagings including empty intermediate bulk containers (IBCs), uncleaned, of 31° 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 underlined in 31°, e.g. Empty packagings, 5.2, 31°, ADR. In the case of empty tank-vehicles, empty demountable tanks, empty tank-containers, uncleaned, this description shall be completed by adding the words "Last load" together with the chemical name and item number of the goods last loaded. e.g. Last load: 3109 organic peroxide type F, liquid, (tert-butyl hydroperoxide), 9°(b).

2568-2599

CLASS 6.1

2600 (1) Amend the second sentence of footnote 1/ to read:

"Substances, mixtures and solutions not expressly mentioned, and all pesticides of 71° to 88°, shall be classified under the appropriate item and letter according to the following provisions:".

2601 15° (c) Insert: "bromochloromethane"

17° (c) Delete: "hexachloroethane"

Before 31°, amend Notes 2 and 3 relating to heading C. to read:

"NOTE 2: Spontaneously flammable organometallic compounds are substances of Class 4.2 (see marginal 2431, 31° to 33°)."

"NOTE 3: Organometallic compounds and their solutions which, in contact with water, emit flammable gases are substances of Class 4.3 (see marginal 2471, 3°)."

42° (a) Delete entry and replace by "(a) ..."

43° Amend title to read:

"Preparations of phosphides containing additives to retard the release of flammable gases such as"

Amend Note 1 to read:

"NOTE 1: These preparations shall not be accepted for carriage unless they contain additives to retard the release of flammable gases."

Amend parenthesis at the end of Note 2 to read:

"(see marginal 2471, 18°)."

44° Delete this whole item.

52° (b) Add: "mercuric nitrate, mercurous nitrate"

2601 (cont'd) 53° (b) Delete "..." and insert: "thallium nitrate"

54° At the end, add:

"NOTE: Beryllium nitrate is a substance of Class 5.1 (see marginal 2501, 29° (b))"

58° At the end of Note 2, amend "4°" to "29°"

59° At the end of Note 2, amend "4°" to "29°"

60° At the end of Note 1, amend "4°", 7°, 8° and 9°" to "29°".

62° At the end of Note 1, amend "4° and 7°" to "29°".

91° Delete "and empty small bulk containers" and insert "and" before "empty tank containers".

2602 (3) Amend "3600 (3)" to "3611 (2)".

2606 (2) Amend end to read:

"... may also be packed in metal intermediate bulk containers (IBCs) conforming to marginal 3622, rigid plastics intermediate bulk containers (IBCs) conforming to marginal 3624 or composite intermediate bulk containers (IBCs) with rigid plastics inner receptacle conforming to marginal 3625."

(4) (c) Amend to read as follows:

"(c) in flexible intermediate bulk containers (IBCs) conforming to marginal 3623 with the exception of intermediate bulk containers (IBCs) of types 13H1, 13L1 and 13M1, in composite intermediate bulk containers (IBCs) with flexible plastics inner receptacle conforming to marginal 3625, fibreboard intermediate bulk containers (IBCs) conforming to marginal 3626 or wooden intermediate bulk containers (IBCs) conforming to marginal 3627, provided that the goods are carried as a full load or the flexible intermediate bulk containers (IBCs) are loaded on pallets."

2607 (2) Amend end in same way as 2606 (2).

(3) (c) Amend to read as follows:

"(c) in flexible intermediate bulk containers (IBCs) conforming to marginal 3623 with the exception of intermediate bulk containers (IBCs) of types 13H1, 13L1 and 13M1, in composite intermediate bulk containers (IBCs) with flexible plastics inner receptacle conforming to marginal 3625, fibreboard intermediate bulk containers (IBCs) conforming to marginal 3626 or wooden intermediate bulk containers (IBCs) conforming to marginal 3627."

2609 At the end, for "3607 (5)" read "3601 (6)".

2612 Above the text, insert subheading "Danger labels".

Delete second sentences of paragraphs (1) and (2).

2612 (cont'd) In paragraph (3), delete "and" after "No.3" and add the following at the end of the paragraph:

"and those containing thallium nitrate of 53° a label conforming to model No. 05."

2614 (1) In the third sentence, delete "underlined and".

Amend the last sentence to read:

"For the carriage of solutions and mixtures (such as preparations and wastes) contaning several components subject to the provisions of ADR, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures."

(3) Delete - Paragraph (4) becomes (3).

2622 (4) Delete the second sentence.

CLASS 6.2

2664 Above the text, insert subheading "Danger labels".

2666 In the third sentence, delete "underlined and".

2673 Delete the last sentence

CLASS 7

2700 (1) (a) After "listed in" add "or assigned to an n.o.s. entry in"

2701 (1) Delete footnote 4/, and "4/" (in four entries).

2702 In item 4, replace "transporting" by "carrying".

In item 13(a), read:

": see marginals 2710 and 3712."

2703 Amend 7. (a) to read:

"(a) Packages bearing a label conforming to models Nos. 7A, 7B or 7C shall not be loaded together on the same vehicle with packages bearing a label conforming to models Nos. 1, 1.4, 1.5 or 01."

In 8. (a), 8. (b) and 9. (a), amend "Model No. 5" to "Model No. 05".

2704 Schedules 1 to 13, number 10, Transport Document : Delete the underlining of one or several parts of sentence between quotation marks which is or are underlined and delete the following sentence: "This denomination should be underlined".

Schedule 1,2. Delete letter "(d)", remove indentation.

Schedule 4 After Note 1 insert the following Note 2 and renumber existing Note 2 as Note 3:

"NOTE 2: (a) Empty uncleaned packagings which, as a result of damage or other mechanical defects, can no longer be closed securely shall, if they cannot be carried in other packagings in accordance with the provisions of this Class, be carried under special arrangements (Schedule 13);

(b) Empty uncleaned packagings on which the internal non-fixed contamination (activity of the residue) exceeds the maximum values given in Section 1 (c) may only be carried as packages in accordance with the various schedules (marginal 2701 (3)), depending on the amount and form of their residual activity and contamination;

(c) Empty packagings which have been cleaned to such an extent that no further contamination exists in excess of the value of 0.4 Bq/cm^2 (10^{-5} Ci/cm^2) for beta- or gamma-emitters and 0.04 Bq/cm^2 (10^{-6} Ci/cm^2) for alpha-emitters and which do not contain any radioactive material with a specific activity of more than 70 kBq/kg (2 nCi/g) are no longer subject to the provisions of this Class."

In Schedules 1 to 4, delete the last sentence of Section 10.

In Schedules 5 to 13, delete the penultimate sentence of section 10(b).

2716 Last box to read as follows:

I	2	3	4	5	6
Type B(U) packagings, Type B(M) packagings and packagings containing fissile material, which meet the provisions of ADR applicable on 31.12.1989		Yes	Yes	See Note I	3755

CLASS 8

2801 4° In the Note, amend "72.5 %" to "72 %" (twice) and "2501, 3°" to "2501, 3° (a)"

11° At the end of Note, amend "10°" to "31° (b)".

26° Delete existing entry for (a) and replace by "(a)...".

Existing Note becomes Note 1. Add Note 2 as follows:

"NOTE 2: Bromine pentafluoride, bromine trifluoride and iodine pentafluoride are substances of Class 5.1 (see marginal 2501, 5°)."

37° Amend Note to read:

"NOTE: Chlorosilanes which, in contact with water, emit flammable gases are substances of Class 4.3 (see marginal 2471, 1°)."

41° Amend (c) to read:

"(c) soda lime with more than 4 % sodium hydroxide.

NOTE: Soda lime with not more than 4 % sodium hydroxide is not subject to the provisions of ADR."

45° (b) At the end of Note, amend "6° (c)" to "13°".

61° Amend to read: "Chlorite and hypochlorite solutions, such as:"

In (b), delete semi-colon and add:

"sodium chlorite solution containing more than 5 % available chlorine;"

Amend beginning of Note to read "Chlorite and hypochlorite solutions ..." and number it Note 1. Add Notes 2 and 3 as follows:

"NOTE 2: Solid chlorites are substances of Class 5.1 (see marginal 2501, 14°).

NOTE 3: Solid hypochlorites are substances of Class 5.1 (see marginal 2501, 15° and 29)."

62° Delete the whole item and the Notes. Replace with: "62° (reserved)".

71° After "empty tank-containers" insert: "as well as empty vehicles for carriage in bulk".

2802 (3) Amend "3600 (3)" to "3611 (2)".

2805 (1) In Note 2, delete "26° (a)".

2806 (2) Amend end to read:

"... may also be packed in metal intermediate bulk containers (IBCs) conforming to marginal 3622, rigid plastics intermediate bulk containers (IBCs) conforming to marginal 3624 or composite intermediate bulk containers (IBCs) with rigid plastics inner receptacle conforming to marginal 3625."

(3) (c) Amend to read as follows:

"(c) in flexible intermediate bulk containers (IBCs) conforming to marginal 3623 with the exception of intermediate bulk containers (IBCs) of types 13H1, 13L1 and 13M1, in composite intermediate bulk containers (IBCs) with flexible plastics inner receptacle conforming to marginal 3625, or fibreboard intermediate bulk containers (IBCs) conforming to marginal 3626 or wooden IBCs conforming to marginal 3627, provided that the goods are carried as a full load or the flexible intermediate bulk containers (IBCs) are loaded on pallets."

2807 (2) Amend in same way as 2806 (2).

2807 (3) (c) Amend to read as follows:

"(c) in flexible intermediate bulk containers (IBCs) conforming to marginal 3623 with the exception of intermediate bulk containers (IBCs) of types 13H1, 13L1 and 13M1, in composite intermediate bulk containers (IBCs) with flexible plastics inner receptacle conforming to marginal 3625, fibreboard intermediate bulk containers (IBCs) conforming to marginal 3626 or wooden intermediate bulk containers (IBCs) conforming to marginal 3627."

2808 Delete "or 62°". At the end, for "3607 (5) read "3601 (6)".

2812 Above the text, insert subheading "Danger labels".

Delete existing paragraph (2).

In paragraph (3), which becomes (2), delete all after "6.1".

(4) and (5) become (3) and (4).

2814 Amend the last sentence to read:

"For the carriage of solutions and mixtures (such as preparations and wastes) containing several components subject to the provisions of ADR, it will not in general be necessary to refer to more than two components which predominately contribute to the danger or dangers of the solutions and mixtures."

2822 (3) Delete the second sentence

CLASS 9

2901 1° Delete Note 2; "Note 1" becomes "Note".

Amend 2° and 3° as follows:

"2° Polychlorinated and polyhalogenated biphenyls (PCBs) and terphenyls (PCTs) and mixtures containing these substances:

(b) 2315 polychlorinated biphenyls, 3151 polyhalogenated biphenyls, liquid or 3151 polyhalogenated terphenyls, liquid, 3152 polyhalogenated biphenyls, solid or 3152 polyhalogenated terphenyls, solid

NOTE: Mixtures with a PCB or PCT content of not more than 50 mg/kg are not subject to the provisions of ADR.

3° Apparatus such as transformers, condensers and apparatus containing substances of 2°(b) or mixtures thereof."

Insert the following new Sections C to E (existing "C" becomes "F")

"C. Substances evolving flammable vapour

4° Expandable polymers containing flammable liquids with a flash-point not exceeding 55° C.

(c) 2211 polymeric beads, expandable, evolving flammable vapour.

D. Lithium batteries

NOTE: Special packing conditions are applicable to these articles (see marginal 2906).

5° 3090 lithium batteries, 3091 lithium batteries contained in equipment

NOTE 1: Each cell shall not contain more than 12 g of lithium. The quantity of lithium 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 in each cell may be raised to 60 g and a package may contain up to 2500 g of lithium; the competent authority shall determine the conditions of carriage as well as the type and duration of the test. If the country of origin is not a party to ADR, the approval shall be recognized by the competent authority of the first ADR country reached by the consignment."

2901 (cont'd)

NOTE 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. Batteries contained in equipment shall be protected against short circuits and be securely held in place.

NOTE 3: Cells and batteries shall be so designed and constructed that they are capable of meeting the following tests:

Test 1: the cell or battery shall be subjected to a thermal stability test at 75° C for 48 hours and show no evidence of distortion, leakage or internal heating.

This test shall be performed on at least 10 cells and one battery of each type taken from production each week.

Test 2: as a result of intentional short circuiting, the cell or battery shall be rendered inert, preferably without venting (through the use of internal fusing devices). If venting does occur, an open flame shall be applied to the venting fumes to prove that an explosive condition does not exist.

This test shall be performed on at least three cells and one battery of each type taken from production each week.

NOTE 4: Cells which have been discharged to the extent that the open circuit voltage is less than two volts or two thirds of the voltage of the undischarged cell, whichever is the lower, or batteries containing one or more such cells shall not be accepted for carriage.

NOTE 5: Cells of batteries contained in equipment shall not be capable of being discharged during carriage to the extent that the open circuit voltage falls below two volts or two thirds of the voltage of the undischarged cell, whichever is the lower.

NOTE 6: Articles of 5° which do not meet these conditions shall not be accepted for carriage.

E. Life-saving appliances

NOTE: Special packing conditions are applicable to these articles (see marginal 2907).

2901 (cont'd)

6° 2990 life-saving appliances, self-inflating, such as aircraft evacuation chutes and aircraft survival kits.

NOTE: These appliances present a hazard if the self-inflating device is activated during carriage, and may also include one or more of the following substances or articles of ADR as equipment:

signal devices of Class 1, such as smoke and illumination signal flares:

non-flammable, non-toxic gases of Class 2;

flammable substances of Classes 3 or 4.1;

organic peroxides of Class 5.2, as components of repair kits;

electric storage batteries of Class 8.

7° 3072 life-saving appliances, not self-inflating, including one or more of the following substances or articles of ADR as equipment:

signal devices of Class 1, such as smoke and illumination signal flares;

non-flammable, non-toxic gases of Class 2;

flammable substances of Classes 3 or 4.1;

organic peroxides of Class 5.2, as components of repair kits;

electric storage batteries or corrosive solids of Class 8.

F. Empty packagings

"NOTE" becomes "NOTE 1"; add the following NOTE 2:

"NOTE 2: Uncleaned empty containment vessels for apparatus of 3° shall not be accepted for carriage."

Amend 11° to read:

"11° Empty packagings, including empty intermediate bulk containers (IBCs), empty tank-vehicles, empty demountable tanks and empty tank-containers, uncleaned, which have contained substances of 1° or 2° of Class 9."

2901a (1) Amend "1° and 2°" to "1°, 2° and 4°".

Add the following new paragraph (2), existing (2) becomes (3):

"(2) The following substances and articles of 1° are furthermore not subject to the provisions for this Class contained in this annex and in Annex B:

(a) asbestos so immersed or fixed in a natural or artificial binder material (such as cement, plastics, asphalt, resins or mineral ore) that no escape of hazardous quantities of respirable asbestos fibres can occur during carriage;

(b) finished products containing asbestos when they are so packed that no escape of hazardous quantities of respirable asbestos fibres can occur during transport."

Add the following new paragraph (4):

"(4) Lithium batteries of 5° conforming to the following provisions, and equipment containing only such 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."

2902 Add the following new paragraph (2):

"(2) Intermediate bulk containers (IBCs) shall satisfy the conditions of Appendix A.6."

2902 (cont'd) Renumber "(2)" as "(3)" and amend the first sentence to read:

"(3) In accordance with the provisions of marginals 2900 and 3511 (2) or 3611 (2) the following shall be used:"

In the first subparagraph, add after "'Y' or 'X'", "or intermediate bulk containers (IBCs) of packing group II, marked with the letter 'Y'."

In the second subparagraph, add after "'Z', 'Y' or 'X'", "or in intermediate bulk contaniners (IBCs) marked with the letter 'Z' or 'Y'."

2903 Add to paragraph (1):

"; or

(g) in metal IBCs conforming to marginal 3622, rigid plastics IBCs conforming to marginal 3624 or composite IBCs with a rigid plastics inner receptacle conforming to marginal 3625."

Add to paragraph (2):

"; or

(c) in composite IBCs with a flexible plastics inner receptacle conforming to marginal 3625, flexible IBCs conforming to marginal 3623, fibreboard IBCs conforming to marginal 3626 or wooden IBCs conforming to marginal 3627, provided that the goods are carried as a full load."

2904 Add to paragraph (1):

"; or

(i) in metal IBCs conforming to marginal 3622, rigid plastics IBCs conforming to marginal 3624 or composite IBCs conforming to marginal 3625".

Add to paragraph (2):

"; or

(c) in flexible IBCs conforming to marginal 3623, fibreboard IBCs conforming to marginal 3626 or wooden IBCs conforming to marginal 3627.

NOTE: IBCs conforming to marginal 3626 containing substances of 4° (c) and transported as a full load need only meet the requirements of marginal 3621 (1) to (3), (5) and (6)".

2904 (cont'd) Add the following new paragraph (3):

"(3) Substances of 4° (c) may also be packed in tightly closed leakproof packagings which need only meet the conditions of marginal 3500 (1), (2) and (5) to (7)."

Add new marginal 2906 as follows:

"2906 (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) removable head drums conforming to marginal 3523 for plywood, 3525 for fibre or 3526 for plastics; 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.

The combination packagings shall conform to a design type which has been tested and approved, in accordance with Appendix A.5, for packing group II. No single packaging or inner packaging of a combination packaging shall contain more than 500 g of lithium (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) Equipment containing lithium batteries of 5° shall be secured against movement within the packaging and be so packed as to prevent accidental operation during carriage."

Add a new marginal 2907 as follows:

"2907 (1) Life-saving appliances of 6° shall be packed, individually, in strong outer packagings.

(2) Substances and articles of ADR contained within life-saving appliances of 6° or 7° as equipment shall be packed in inner packagings. These inner packagings shall be so stowed as to prevent any movement within the appliances.

(3) Non-flammable, non-toxic gases of Class 2 shall be contained in cylinders conforming to marginal 2202 which may be connected to the life-saving appliance.

(4) Signal devices of Class 1 shall be packed in plastics or fibreboard inner packagings.

(5) Strike-anywhere matches of Class 4.1 (marginal 2401, 2° (c), No. 1331) shall be packed in inner packagings to prevent any movement."

2912 Above the text, insert subheading "Marking".

Amend to read as follows:

(1) Packagings containing substances of 4° (c) shall bear the following marking: 'Keep away from any source of ignition'. This marking shall be in an official language of the forwarding country, and also, if that language is not English, French or German, in English, French or German, unless any agreements concluded between the countries concerned in the transport operation provide otherwise.

Danger labels

(2) Packages containing substances or articles of this class, with the exception of substances of 4° (c), shall bear a label conforming to model No.9.

(3) Packages containing substances of 2° (b) having a flash-point up to and including 55° C shall in addition bear a label conforming to model No. 3.

(4) Packages containing articles of 6° or 7° shall not bear a label conforming to model No. 9 unless the article is fully enclosed by packaging, crates or other means that prevent the ready identification of the article.

(5) Packages containing fragile receptacles not visible from the outside shall bear on two opposite sides a label conforming to model No. 12.

(6) Packages containing liquids in receptacles the closures of which are not visible from the outside shall bear on two opposite sides a label conforming to model No. 11."

Amend marginal 2914 to read as follows:

2914 "(1) The description of the goods in the transport document shall conform to one of the identification numbers and one of the names underlined in marginal 2901.

The description of the goods shall be followed by particulars of the class, the item number, the letter, if any and the initials "ADR" (or "RID"), e.g. 9, 1° (b), ADR.

For the carriage of wastes (see marginal 2000 (4)), the description of the goods shall be: "Waste, containing ...", the component(s) used for the classification of the waste under marginal 2002 (8) to be entered under its/their chemical name(s), e.g. "Waste containing 2212 brown asbestos, 9, 1° (b), ADR".

For the carriage of solutions and mixtures (such as preparations and wastes) containing several components subject to the provisions of ADR, it will not in general be necessary to refer to more than two components which predominantly contribute to the danger or dangers of the solutions and mixtures.

2914 (cont'd) (2) For the carriage of articles of 5° with the approval of the competent authority (see Note 1 to marginal 2901, 5°), a copy of the approval with the conditions of carriage shall be attached to the transport document. This approval shall be drawn up in an official language of the forwarding country and also, if that language is not English, French or German, in English, French or German, unless any agreements concluded between the countries concerned in the transport operation provide otherwise."

2921 In paragraphs (2) and (3), after "packagings" insert:

"including intermediate bulk containers (IBCs)".

In paragraph (4), delete the second sentence.

(1) Read: "ST/SG/AC.10/11/Rev.1 second edition".

APPENDIX A.1

3101 (1) last sentence) After "name" insert "or n.o.s. entry"
(3) first sentence)

At the end of paragraph (3), add:

"Explosive substances and articles shall only be assigned to an n.o.s. entry if they cannot be assigned to a name in Table 1 of marginal 2101. Assignment to an n.o.s. entry shall be made by the competent authority of the country of origin."

3102 (1) Replace "7°(a)" by "24°(a)".

(2) Delete "Re marginal 2401, 7°(b) and (c):"

(7) Replace "of marginal 2401, 7°(b)" by "conforming to paragraph (2)".

(8) Read: "Weakly nitrated nitrocellulose conforming to paragraph (1) shall first undergo ..." (remainder unchanged).

3103 Amend text to read:

"Substances and articles of Class 5.2 can only be accepted for carriage when the relevant criteria in Parts II and III of the "Recommendations on the Transport of Dangerous Goods: Tests and Criteria" (second edition, published by the United Nations Organization under the reference ST/SG/AC.10/11/Rev. 1) are met. The test selected for determining the self-accelerating decomposition temperature (SADT) shall be conducted in a manner which is representative, both in size and material, of the package to be carried."

Add the following new heading and marginal:

"Principles for classification

3104 (1) An organic peroxide or organic peroxide formulation shall be regarded as possessing explosive properties when in laboratory testing it is liable to detonate, to deflagrate rapidly or to show a violent effect when heated under confinement.

(2) The following principles shall be applied to the classification of an organic peroxide or organic peroxide formulation not listed in marginal 2551:

(a) any organic peroxide or organic peroxide formulation which can detonate or deflagrate rapidly, as packaged for carriage, shall be prohibited from carriage in that packaging under Class 5.2 (defined as organic peroxide type A, exit box A of Figure 1).

(b) any organic peroxide or organic peroxide formulation possessing explosive properties and which, as packaged for carriage, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that packaging, shall also bear a label conforming to model No. 01. Such an organic peroxide may be packaged in amounts of up to 25 kg unless the maximum quantity has to be limited to a lower amount to preclude detonation or rapid deflagration in the package (defined as organic peroxide type B, exit box B of Figure 1).

3104 (cont'd)

(c) any organic peroxide or organic peroxide formulation possessing explosive properties may be carried without a label conforming to model No. 01 when the substance as packaged (maximum 50 kg) for carriage cannot detonate or deflagrate rapidly or undergo a thermal explosion (defined as organic peroxide type C, exit box C of Figure 1).

(d) any organic peroxide or organic peroxide formulation which in laboratory testing:

- detonates partially, does not deflagrate rapidly and shows no effect when heated under confinement; or

- does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or

- does not detonate or deflagrate at all and shows a medium effect when heated under confinement

may be accepted for carriage in packages containing not more than 50 kg (defined as organic peroxide type D, exit box D of Figure 1).

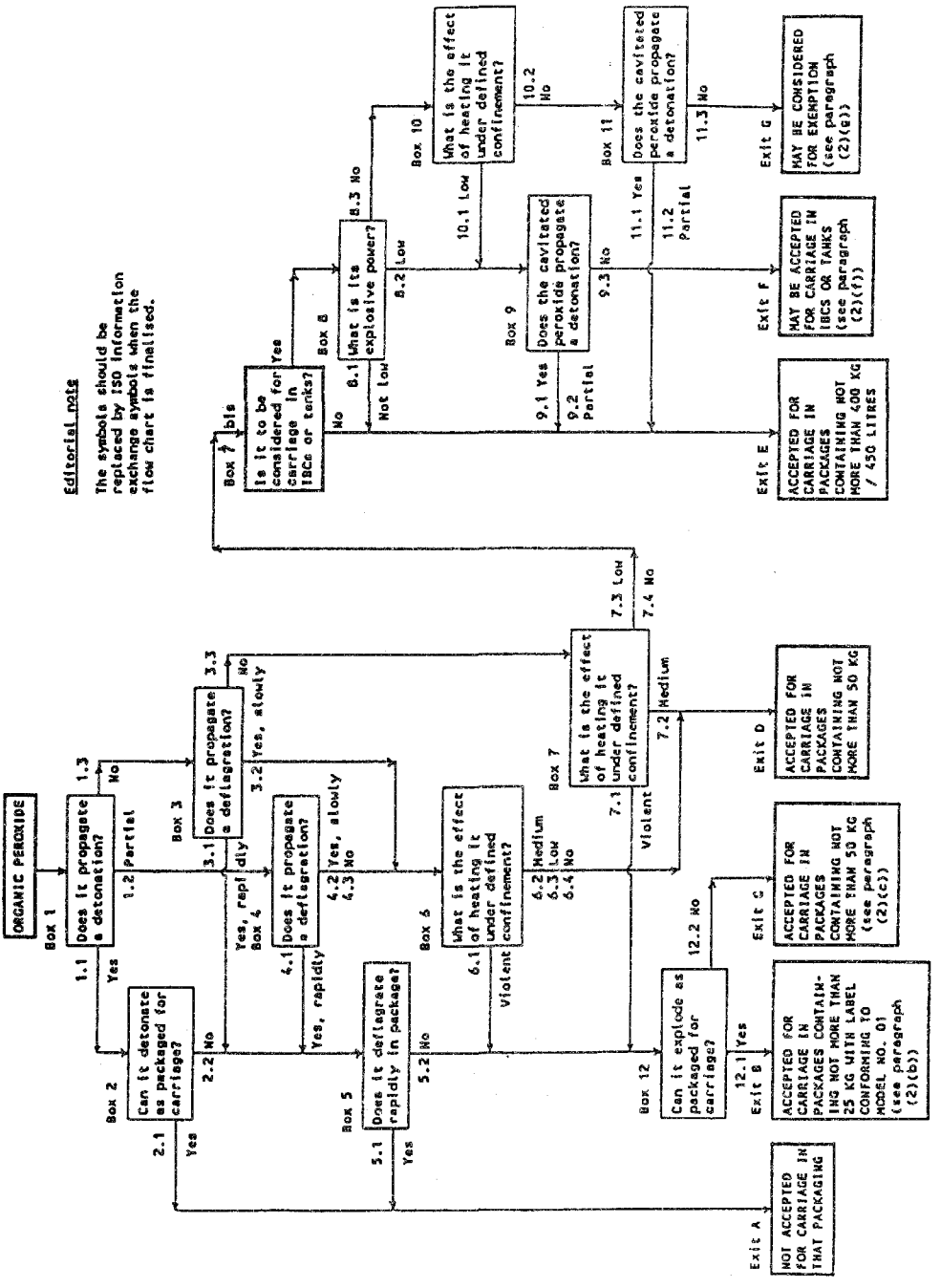
(e) any organic peroxide or organic peroxide formulation which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement may be accepted for carriage in packages containing not more than 400 kg/450 litres (defined as organic peroxide type E, exit box E of Figure 1).

(f) any organic peroxide or organic peroxide formulation which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows only a low or no effect when heated under confinement as well as low or no explosive power may be accepted for carriage in intermediate bulk containers (IBCs) or tanks (defined as organic peroxide type F, exit box F of Figure 1).

(g) any organic peroxide or organic peroxide formulation which, in laboratory testing, neither detonates in the cavitated state nor deflagrates at all and shows no effect when heated under confinement, nor any explosive power shall be exempted from Class 5.2, provided that the formulation is thermally stable (self-accelerating decomposition temperature is 60°C or higher for a 50 kg package) and for liquid formulations, a diluent type A is used for desensitization (defined as organic peroxide type G, exit box G of Figure 1).

(3) Paragraph (2) refers only to those properties of organic peroxides which are decisive for classification. A flow chart, presenting the classification principles in the form of a graphically arranged scheme of questions concerning the decisive properties together with the possible answers, is given in Figure 1. These properties shall be determined experimentally in accordance with marginal 3103."

FIGURE 1 - Classification and flow-chart scheme for organic peroxides



3170 In Note 2, amend "(e.g. 19°/0171)" to read "(e.g. 21°/0171".

The item numbers assigned to the names in the glossary are amended as follows:

1° to 10°	:	no change
11° to 21°	:	become 13° to 23°
22° to 28°	:	become 26° to 32°
29° to 37°	:	become 35° to 43°
38° to 41°	:	become 46° to 49°

Add three new entries to the glossary:

"Articles, pyrophoric 25°/0380
Articles which contain a pyrophoric substance (capable of spontaneous ignition when exposed to air) and an explosive substance or component. The term excludes articles containing white phosphorus."

"Contrivances, water-activated with burster, expelling charge or propelling charge 25°/0248; 34°/0249
Articles whose functioning depends upon physico-chemical reaction of their contents with water."

"Rocket motors with hypergolic liquids with or without expelling charge 25°/0322; 34°/0250
Articles consisting of a hypergolic fuel contained in a cylinder fitted with one or more nozzles. They are designed to propel a rocket or a guided missile."

APPENDIX A.3

A. Tests relating to flammable liquids of Classes 3, 6.1 and 8

Test for determining flash-point

3300 (1) The flash-point shall be determined by means of one of the following types of apparatus:

(a) for use at temperatures not exceeding 50°C: Abel, Abel-Pensky, Luchaire-Finances, Tag;

(b) for use at temperatures above 50°C: Pensky-Martens, Luchaire-Finances;

(c) failing these, any other closed-cup apparatus capable of giving results within 2°C of those which an apparatus listed above would give at the same place.

(2) To determine the flash-point of paints, gums and similar viscous products containing solvents, only apparatus and test methods suitable for determining the flash-point of viscous liquids shall be used, such as method A of IP[1/] standard 170/90 or more recent IP standards or German standard DIN 53 213.

3301 The test procedure shall be:

(a) for the Abel apparatus, that of IP[1/] standard 33/59; this standard may also be used with the Abel-Pensky apparatus;

(b) for the Pensky-Martens apparatus, that of IP[1/] standard 34/88, or that of ASTM 2/ standard D.93/80;

(c) for the Tag apparatus, that of ASTM[2/] standard D.56/87;

(d) for the Luchaire apparatus, that of the French standard NFT 60.103.

If any other apparatus is used, the following precautions shall be taken:

1. The test shall be performed in a place free from draughts.
2. The rate of temperature increase of the liquid being tested shall never exceed 5°C per minute.
3. The pilot-flame shall be 5 mm (± 0.5 mm) long.
4. The pilot-flame shall be applied to the opening of the receptacle at each rise of 1°C in the temperature of the liquid.

3302 In the event of a dispute as to the classification of a flammable liquid, the item number proposed by the consignor shall be accepted if a check-test of the flash-point yields a result not differing by more than 2°C from the limits (21°C, 55°C and 100°C respectively) stated in marginal 2301. If the difference is more than 2°C, a second check-test shall be carried out, and the highest figure obtained shall be adopted.

1/ The Institute of Petroleum, 61 New Cavendish Street, London, W1M 8AR.
2/ American Society for Testing and Materials, 1916 Race Street, Philadelphia 3 (Pa.).

Test for determining peroxide content

3303 To determine the peroxide content of a liquid, the procedure is as follows:

A quantity p (about 5g, weighed to the nearest 0.01 g) of the liquid to be titrated is placed in an Erlenmeyer flask; 20 cm^3 of acetic anhydride and about 1g of powdered solid potassium iodide are added; the flask is shaken and, after 10 minutes, heated for 3 minutes to about 60°C. When it has been left to cool for 5 minutes, 25 cm^3 of water are added. After this, it is left standing for half an hour, then the liberated iodine is titrated with a decinormal solution of sodium thiosulphate, no indicator being added; complete discoloration indicates the end of the reaction. If n is the number of cm^3 of thiosulphate solution required, the percentage of peroxide (calculated as H_2O_2) present in the sample is obtained by the formula $\frac{17\ n.}{100\ p}$

3304-
3309

B. Test for determining fluidity

3310 To determine the fluidity of liquid or viscous substances and mixtures of Class 3 and pasty substances of Class 4.1, the following test method shall be used.

(a) Test apparatus

Commercial penetrometer conforming to ISO Standard 2137-1985, with a guide rod of 47.5 g ± 0.05 g; sieve disc of duralumin with conical bores and a mass of 102.5 g ± 0.05 g (see Figure 1); penetration vessel with an inside diameter of 72 mm to 80 mm for reception of the sample.

(b) Test procedure

The sample is poured into the penetration vessel not less than half an hour before the measurement. The vessel is then hermetically closed and left standing until the measurement. The sample in the hermetically closed penetration vessel is heated to 35°C ± 0.5° and is placed on the penetrometer table immediately prior to measurement (not more than two minutes). The point S of the sieve disc is then brought into contact with the surface of the liquid and the rate of penetration is measured.

(c) Evaluation of test results

A substance is not subject to the provisions of Class 3 but to those of Class 4.1 of ADR if, after the centre S has been brought into contact with the surface of the sample, the penetration indicated by the dial gauge

(i) after a loading time of 5 s ± 0.1 s, is less than 15.0 mm ± 0.3 mm, or

(ii) after a loading time of 5 s ± 0.1 s, is greater than 15.0 mm ± 0.3 mm, but the additional penetration after another 55 s ± 0.5 s is less than 5.0 mm ± 0.5 mm.

3310 (cont'd) NOTE: In the case of samples having a flow point, it is often impossible to produce a steady level surface in the penetration vessel and, hence, to establish satisfactory initial measuring conditions for the contact of the point S. Furthermore, with some samples, the impact of the sieve disc can cause an elastic deformation of the surface and, in the first few seconds, simulate a deeper penetration. In all these cases, it may be appropriate to use the evaluation in (b) above.

3311-3319

C. Tests relating to flammable solids of Class 4.1

Test methods for readily combustible solids

3320 (1) Preliminary screening test

(a) The substance in its commercial form shall be formed into an unbroken strip or powder train about 250 mm long by 20 mm wide by 10 mm high on a cool, impervious, low heat-conducting base plate.

(b) A hot flame (minimum temperature 1,000° C) from a gas burner (minimum diameter 5 mm) is applied to one end of the powder train until the powder ignites or for a maximum of 2 minutes (5 minutes for powders of metals or metal alloys). It shall be noted whether combustion propagates along 200 mm of the train within the two-minute test period (or 20 minutes for metal powders).

(c) If the substance does not ignite and propagate combustion either by burning with flame or smouldering along 200 mm of the powder train within the two-minute (or 20 minute) test period, the substance shall not be classified as a flammable solid and no further testing is required.

(d) If the substance propagates burning over a 200 mm length of the powder train in less than two minutes, or less than 20 minutes for metal powders, the full test programme below shall be carried out.

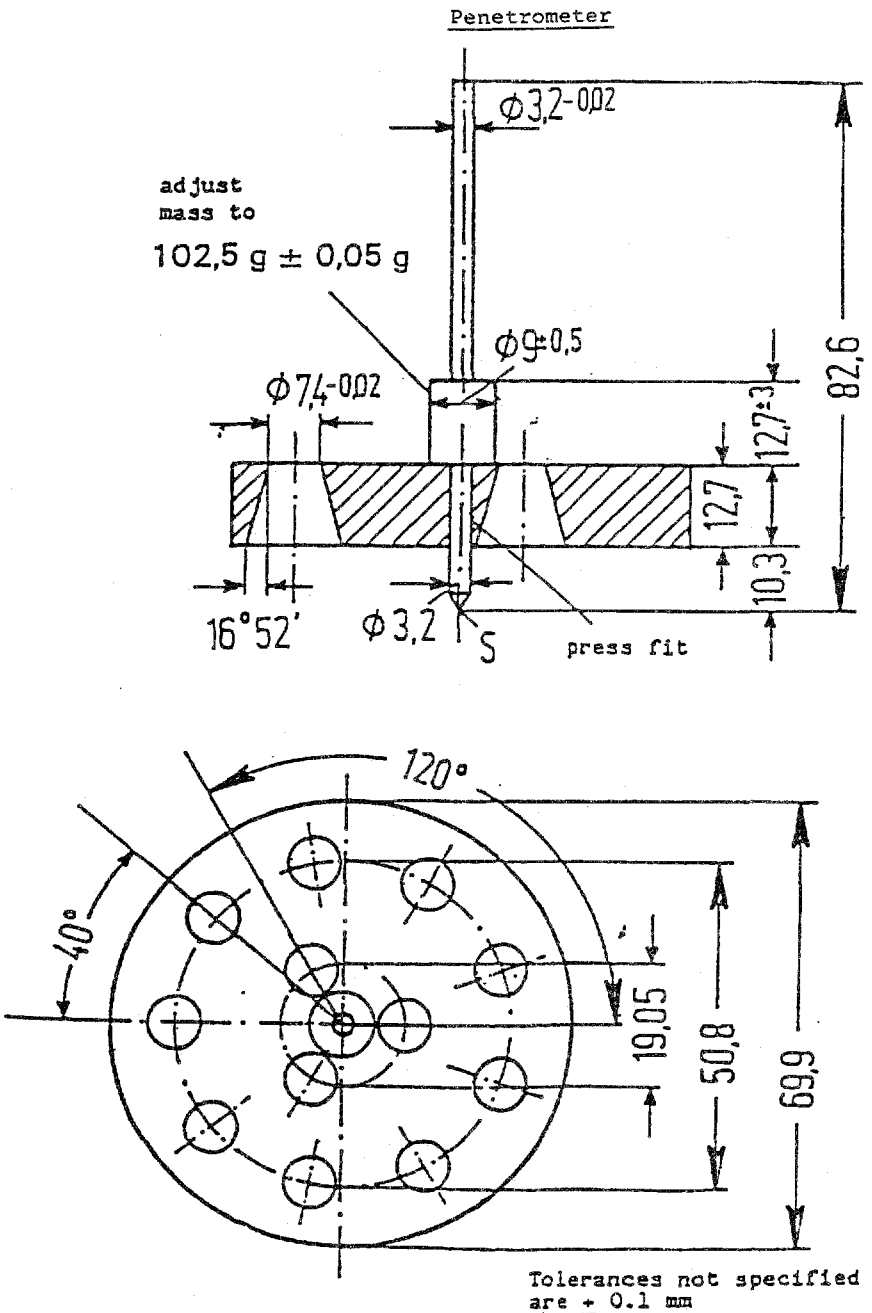
(2) Burning rate test

In order to differentiate between any substance that can be ignited and those which burn rapidly or whose burning behaviour is particularly dangerous, only substances whose burning rate exceeds a certain limit shall be classified in Class 4.1. A burning time of less than 45 s measured over a length of 100 mm according to the procedure in marginal 3320 (3) is taken as the criterion. An attempt is made to ignite the substance under the conditions defined below and the burning time is measured. The pile is wetted beyond the zone over which the burning rate is measured and the effect on flame propagation is noted.

Appendix A.3

Figure 1

Penetrometer



Tolerances not specified are ± 0.1 mm

3320 (cont'd) (3) Test procedure

(a) The powdered or granular substance, in its commercial form, is loosely filled into a mould 250 mm in length with triangular cross-section of inner height 10 mm and width 20 mm. On both sides of the mould, in the longitudinal direction, two metal sheets are mounted as lateral limitations which extend 2 mm beyond the upper edge of the triangular cross-section (see Figure 2. Mould and accessories for the preparation of the pile). The mould is then dropped three times from a height of 2 cm onto a solid surface. The lateral limitations are then removed and an impervious, non-combustible, low heat-conducting plate is placed on top of the mould, the apparatus inverted and the mould removed. Pasty substances are spread on a non-combustible surface in the form of a rope 250 mm in length with a cross-section of about 1 cm^2. Any suitable ignition source such as a small flame or a hot wire of minimum temperature 1,000° C is used to ignite the pile at one end. In the case of a moisture-sensitive substance, the test shall be carried out as quickly as possible, after removal of the substance from the container.

(b) The pile shall be arranged across the draught in a fume cupboard. The air speed shall be sufficient to prevent fumes escaping into the laboratory and shall not be varied during the test. A draught screen may be erected around the apparatus.

(c) 1 ml of a wetting solution shall be added to the pile 30-40 mm beyond the 100 mm timing zone. Apply the wetting solution to the ridge drop by drop, ensuring the whole cross-section of the pile is wetted without loss of liquid from the sides.*/ The liquid shall be applied over the shortest possible length of the pile consistent with avoiding loss from the sides. This part of the test is not applicable to metal powders.

(d) One end of the pile shall be ignited. When the pile has burned over a length of 80 mm, measure the rate of burning over the next 100 mm. Note whether or not the wetted zone stops propagation of the flame. The test shall be performed six times using a clean cool plate each time, unless a positive result is observed earlier.

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*/ If water rolls off the sides of the pile, the addition of wetting agents is necessary. Wetting agents used shall be free from combustible diluents and the total active matter in the wetting solution shall not exceed 1%. This liquid may be added to a hollow up to 3 mm deep and 5 mm in diameter in the top of the pile.

Criteria for classification

3321 (1) Powdered, granular or pasty substances shall be classified in Class 4.1 when the burning time of one or more of the tests, in accordance with the test method described in marginal 3320 (2), is less than 45 s or the rate of burning is more than 2.2 mm/s. Powders of metals or metal alloys shall be classified in this class when they can be ignited and the reaction spreads over the whole length of the sample in 10 minutes or less.

(2) Assignment to a letter in the various items

(a) Any solid, normally wetted, which if in a dry state would be classified as an explosive shall be assigned to the letter (a).

(b) The following shall be assigned to the letter (b):

any self-reactive substance, any combustible solid (other than metal powders) tested in accordance with marginal 3320 if the burning time is less than 45 s and the flame passes the wetted zone, and powders of metal or metal alloys if the reaction spreads over the whole length of the sample in 5 minutes or less.

(c) The following shall be assigned to the letter (c):

any combustible solid (other than metal powders) tested in accordance with marginal 3320 if the burning time is less than 45 s and the wetted zone stops the flame propagation for at least 4 minutes, and metal powders if the reaction spreads over the whole length of the sample in more than 5 minutes.

(d) For solids which may cause or contribute to a fire through friction, a letter in the various items shall be assigned by analogy with existing classifications or in accordance with any appropriate special conditions.

3322–
3329

D. Tests relating to substances liable to spontaneous combustion of Class 4.2

3330 (1) Test method and procedure for solid pyrophoric substances

1 to 2 cm^3 of the powdery substance to be tested shall be poured from a height of about 1 m onto a non-combustible surface and it shall be observed whether the substance ignites during dropping or within 5 minutes of settling. This procedure shall be repeated six times unless a positive result is obtained earlier.

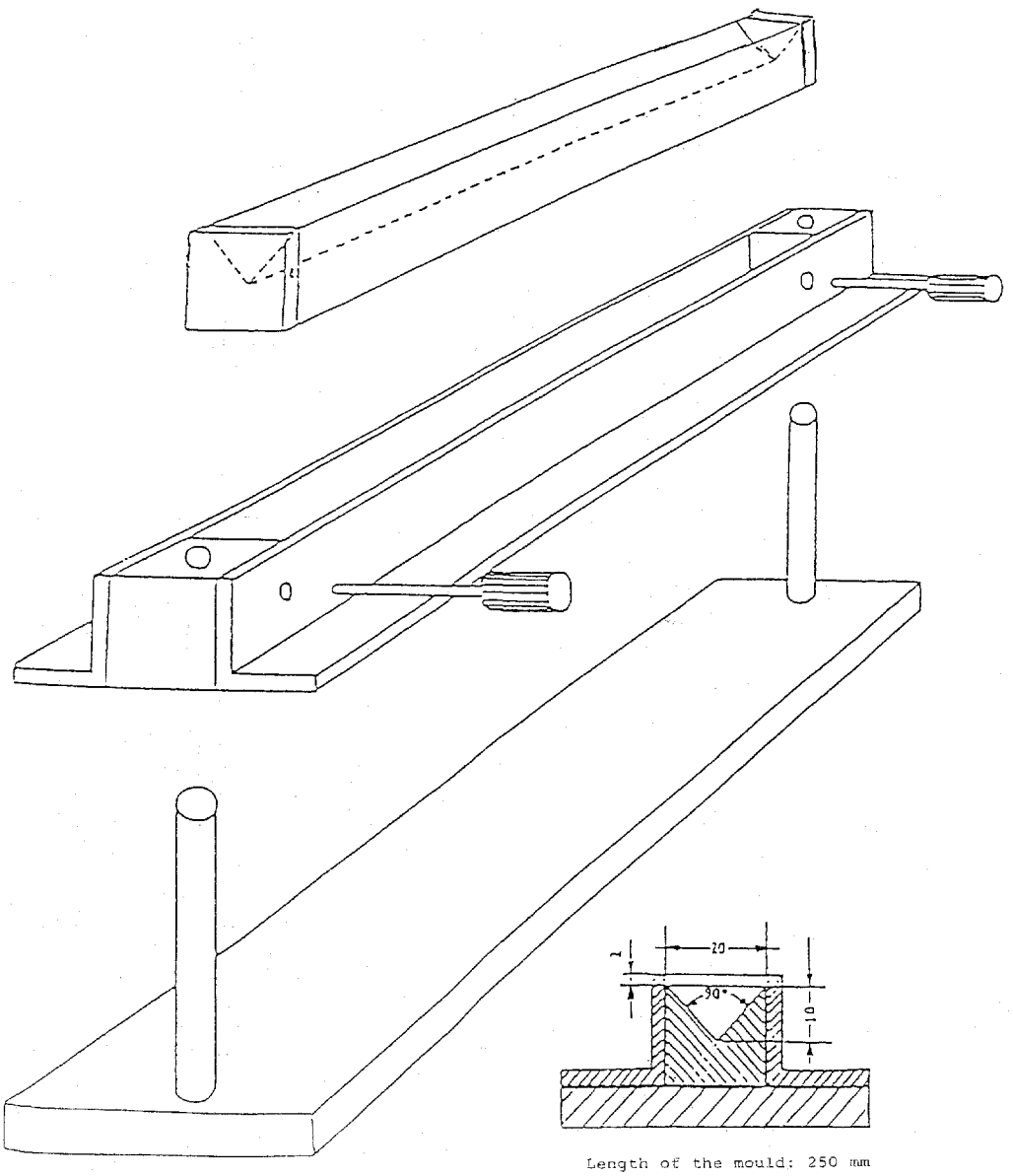
(2) Test method for liquid pyrophoric substances

The test for liquid substances shall be in two parts; the first to determine whether the substance ignites when added to an inert carrier and exposed to air, the second if a negative result is obtained in the first. The second part determines whether the substance chars or ignites a filter paper.

Figure 2

Mould and accessories for the preparation of the pile

(All dimensions in millimetres)



Length of the mould: 250 mm

Material: aluminium

3330 (cont'd) (3) Test procedure for liquid pyrophoric substances

(a) Part 1 - A porcelain cup of about 10 cm diameter shall be filled with diatomaceous earth or silica gel at room temperature to a height of about 5 mm. Approximately 5 ml of the liquid to be tested shall be poured into the prepared porcelain cup and it shall be observed whether the substance ignites within five minutes. This procedure shall be repeated six times unless a positive result is obtained earlier.

(b) Part 2 - A 0.5 ml test sample shall be delivered from a syringe to an indented dry No. 3 Whatman filter paper. The test is conducted at 25° ± 2° C and at a relative humidity of 50 ± 5%. Observations shall be made to see whether ignition or charring occurs on the filter paper within five minutes after the liquid to be tested is introduced. This procedure shall be repeated three times, using a new filter paper each time, unless a positive result is obtained earlier.

Criteria for classification

3331 (1) A solid substance shall be classified in Class 4.2 and considered to be pyrophoric if the sample ignites in one of the tests. A liquid shall be classified in Class 4.2 and considered to be pyrophoric if it ignites in Part 1 of the test, or if the filter paper is ignited or charred in Part 2 of the test.

(2) Assignment to a letter in the various items

All pyrophoric solids and liquids shall be assigned to letter (a).

3332 (1) Test method for self-heating substances

Samples in 2.5 cm and 10 cm cubes shall be kept at a constant temperature for 24 hours and observations shall be made whether the temperature of the sample exceeds 200° C. (The test method is a modified version of the Bowes-Cameron cage test which is a self-heating test method for carbon.)

(2) Test procedure

(a) A hot-air circulating type of oven with an inner volume of more than 9 litres and capable of controlling the internal temperature at 140 ± 2°C shall be used.

(b) Cubic sample containers of 2.5 cm and 10 cm side, made of stainless steel net with a mesh size of 0.053 mm, */ with their top surface open, shall be used. Each container is housed in a cubic container cover made from stainless steel net with a mesh size of 0.595 mm */ and slightly larger than the sample container, so that the container fits in this cover. In order to avoid the effect of air circulation, this cover is installed in a second stainless steel cage, made from a net with a mesh size of 0.595 mm */ and 15 cm x 15 cm x 25 cm in size, shall be further installed to house the cover.

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*/ This mesh size is based on Tyler sieves, where the mesh size varies in proportion to the square of the linear distance between the wires.

3332 (cont'd)

(c) Chromel-Alumel thermocouples of 0.3 mm diameter shall be used for temperature measurement. One is placed in the centre of the sample and another between the sample container and the oven wall. The temperatures shall be measured continuously.

(d) The sample, powdered or granular, shall be prepared in its commercial form and filled to the brim of the sample container and the container tapped several times. If the sample settles, more shall be added. If the sample is heaped it shall be levelled to the brim. The container shall be housed in the cover and hung at the centre of the oven.

(e) The oven temperature shall be raised to 140°C test temperature and maintained for 24 hours. The temperature of the sample shall be recorded. The first test shall be conducted with a 10 cm cube sample. Observations shall be made to determine whether spontaneous ignition occurs or whether the temperature of the sample exceeds 200°C. If negative results are obtained, no further test is necessary. If positive results are obtained, a second test shall be conducted with a 2.5 cm cube sample to determine the packing group assignment.

Criteria for classification

3333 (1) A substance shall be classified in Class 4.2 if, in the first test using a 10 cm cube sample, spontaneous ignition occurs or the temperature of the sample exceeds 200°C during the 24 hours test period. This criterion is based on the self-ignition temperature of charcoal, which is 50°C for a cubic volume of 27 m^3 and 140°C for a one litre sample. Substances with self-ignition temperatures higher than 50°C for 27 m^3 shall not be classified in Class 4.2.

(2) Assignment to letters in the various items

(a) Any substance which gives a positive result when tested with the 2.5 cm cube sample shall be assigned to the letter (b).

(b) Any substance which gives a positive result when tested with the 10 cm cube sample but which gives a negative result with a 2.5 cm cube sample shall be assigned to the letter (c).

3334-
3339

E. Test relating to substances of Class 4.3 which in contact with water emit flammable gases

3340 (1) Test method

This test method is used to determine whether the reaction of a substance with water leads to the development of a dangerous amount of flammable gases. The test method can be applied to solid and liquid substances. It is not applicable to pyrophoric substances. The substance shall be tested in its commercial form at ambient temperature (20°C) by bringing it into contact with water. If spontaneous ignition of the gas occurs at any stage, no further testing is necessary.

3340 (cont'd) (2) Test procedure

(a) A small quantity (approximately 2 mm diameter) of the test substance shall be placed in a trough of distilled water at 20 °C. It shall be noted (i) whether any gas is emitted and (ii) if spontaneous ignition of the gas occurs.

(b) A small quantity of the test substance (approximately 2 mm diameter) shall be placed at the centre of a filter paper which is floated flat on the surface of distilled water at 20 °C in a suitable vessel, e.g. a 100 mm diameter evaporating dish. The filter paper is to keep the substance in one place, under which condition the likelihood of spontaneous ignition of any gas is greatest. It shall be noted (i) whether any gas is emitted and (ii) whether spontaneous ignition of the gas occurs.

(c) The test substance shall be made into a pile approximately 2 cm high and 3 cm diameter with a hollow in the top. A few drops of water shall be added to the hollow. It shall be noted whether (i) any gas is emitted and (ii) whether spontaneous ignition occurs.

(d) For solid substances, the package shall be inspected for any powder of <500 um. If that powder constitutes more than 1 % (mass) of the total, or if the substance is friable, then the whole of the sample shall be ground to a powder before testing to allow for a reduction in particle size during handling and carriage. Otherwise, as for liquids, the substance shall be tested in its commercial state. The test shall be performed at ambient temperature (20 °C) and atmospheric pressure, and repeated three times.

(e) Water is put into the dropping funnel and enough of the substance (up to a maximum weight of 25 g) to produce between 100 cm^3 and 250 cm^3 of gas is weighed and placed in a conical flask. The tap of the dropping funnel is opened to let the water into the conical flask and a stop-watch is started. The volume of gas emitted is measured by any suitable means. The time taken for all the gas to be emitted is noted and, where possible, intermediate readings are taken. The rate of emission of gas is calculated over seven hours at one hour intervals. If the rate of emission is erratic or is increasing after seven hours, the measuring time shall be extended to a maximum of five days. The five-day test may be stopped if the rate of emission becomes steady or continually decreases and sufficient data have been established to be able to assign the substance to a group or to decide that the substance is not to be classified in Class 4.3. If the chemical identity of the gas is unknown, the gas shall be tested for flammability.

Criteria for classification

3341 (1) A substance shall be classified in Class 4.3 if spontaneous ignition occurs at any stage of the test procedure, or if flammable gas is emitted at a rate greater than 1 litre per kilogram of the substance per hour.

3341 (cont'd) (2) Assignment to groups in the various items

(a) The following shall be assigned to letter (a):

any substance which reacts vigorously with water at ambient temperature and emits gas liable to ignite spontaneously, or which reacts readily with water at ambient temperature such that the rate of emission of flammable gas in one minute is equal to or greater than 10 litres per kilogram of substance.

(b) The following shall be assigned to letter (b):

any substance which reacts readily with water at ambient temperature such that the maximum rate of emission of flammable gas is equal to or greater than 20 litres per kilogram of substance per hour, and which does not meet the criteria for letter (a).

(c) The following shall be assigned to letter (c):

any substance which reacts slowly with water at ambient temperature such that the maximum rate of emission of flammable gas is equal to or greater than 1 litre per kilogram of substance per hour, and which does not meet the criteria for letters (a) and (b).

3342-3349

F. Test relating to solid oxidizing substances of Class 5.1.

3350 (1) Test method

This test method is designed to measure the potential for a solid substance to increase the burning rate or burning intensity of a combustible substance when the two are thoroughly mixed. Two tests shall be run for each substance to be evaluated, one at a 1 to 1 ratio (mass), of sample to sawdust and one at a 4 to 1 ratio (mass), of sample to sawdust. The burning characteristics of each mixture are compared with the standard 1 to 1 ratio (mass), of ammonium persulphate.

(2) Test procedure

(a) Ammonium persulphate, potassium perchlorate and potassium bromate are the reference substances. These substances shall pass through a sieve mesh size smaller than 0.3 mm and shall not be ground. The reference substances are dried at 65°C for 12 hours and kept in a desiccator until required.

(b) Softwood sawdust is the combustible material in this test. It shall pass through a sieve mesh size smaller than 1.6 mm and contain less than 5% of water (mass). If necessary, it is made into a layer less than 25 mm thick, dried at 105°C for 4 hours and kept in a desiccator until required.

3350 (cont'd)

(c) A 30.0g ± 0.1g mixture of the reference substance and wood sawdust is prepared in a 1 to 1 ratio (mass). Two 30.0g ± 0.1g mixtures of the substance to be tested, in the particle size in which it will be carried, and the wood sawdust are prepared in ratios of 1 to 1 (mass), and 4 to 1 (mass). Each mixture shall be mixed mechanically without excessive stress as thoroughly as possible.

(d) The test shall be conducted in a draught or a place equipped with a ventilator.

(e) The conditions at normal atmospheric pressure are: temperature 20°C ± 5°C, humidity 50% ± 10%.

(f) Each of the mixtures shall be formed into a conical pile with dimensions of approximately 70 mm base diameter and 60 mm height on a cool, impervious, low heat-conducting surface. Ignition shall be provided by means of a wire of inert metal in the form of a circular loop 40 mm in diameter positioned inside the pile 1 mm above the test surface. The wire shall be heated electrically to 1,000°C until the first signs of combustion are observed or it is clear that the pile cannot be ignited. The electrical power is turned off as soon as there is combustion.

(g) The time shall be recorded from the first observable signs of combustion to the end of all reaction: smoke, flame, incandescence.

(h) The test shall be repeated three times for each of the mixing ratios.

Criteria for classification

3351 (1) A solid substance shall be classified in Class 5.1 if, in either concentration tested, the mean burning time of the sawdust, established from three tests, is equal to or less than that of the average of the three tests with ammonium persulphate mixture.

(2) Assignment to letters in the various items

(a) Any substance which, in either concentration tested, exhibits a burning time less than that with potassium bromate shall be assigned to the letter (a).

(b) Any substance which, in either concentration tested, exhibits a burning time equal to or less than that with potassium perchlorate and does not meet the criteria for group (a) shall be assigned to the letter (b).

(c) Any substance which, in either concentration tested, exhibits a burning time equal to or less than that with ammonium persulphate and does not meet the criteria for letters (a) and (b) shall be assigned to the letter (c).

3352-3399

APPENDIX A.5

Introductory Note, second line amended to read:

"...Classes 1, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 8 and 9".

3500 Add the following new paragraph:

"(12) The requirements for packagings in section III are based on packagings currently used. In order to take into account progress in science and technology, packagings having specifications different from those in section III may be used, provided that they are equally effective, are acceptable to the competent authority and are able successfully to withstand the tests described in paragraph (10) and section IV."

3510 Amend paragraph (1) as follows:

"Under definition of Drums, second sentence, delete the words "made of metal or plastics".

3512 Add the following new paragraph:

"(5) The letter "W" may follow the packaging code to signify that the packaging, although of the same type indicated by the code, is manufactured to a specification different from that in section III and is considered by the competent authority to be equivalent under the provisions of marginal 3500(12)."

Renumber paragraphs "(5)" and "(6)" as "(6)" and "(7)".

Add to paragraph (7) a new third example to read:

"For a steel box of equivalent specification

u n	4A1W/Y136/S/90 GB/MC123	(a), (b), (c), (d), (e), (f) and (g)

Last example, first line, columns 1 and 2, should read:

"RID/ADR/0A2/Y20/S/83 (a)(ii), (b), (c), (d) and (e)"

3514 Table A, heading 6., last entry, fourth column, should read:

"6HH1".

Add the following new entry:

"in solid plastics box 6HH2"

The last two columns under A.1, 2 and 3 are amended as follows:

Code	Marginal
1A1	3520
1A2	3520 3/
1B1	3521
1B2	3521 3/
1D	3523 3/
1G	3525 3/
1H1	3526
1H2	3526 3/
2C1 2C2	3524
3A1	3522
3A2	3522 3/
3H1	3526
3H2	3526 3/

3522 Amend (d) to read:

"Closures of non-removable-head jerricans (3A1) shall either be of the screw-threaded type or be capable of being secured by a screw-threaded device or a device at least equally effective. Closure devices of removable-head jerricans (3A2) shall be so designed and fitted that they will remain secure and that the jerricans will remain leakproof under normal conditions of carriage."

3526 Amend (i) at the second sentence to read:

"Closures of non-removable-head drums and jerricans (1H1, 3H1) shall either be of the screw-threaded type or be capable of being secured by a screw-threaded device or a device at least equally effective. Closure devices of removable-head drums and jerricans (1H2, 3H2) shall be so designed and fitted that they will remain secure and the drums or jerricans will remain leakproof under normal conditions of carriage."

3537 Amend "6HH" to read "6HH1" and add:

"6HH2 plastics receptacle with outer solid plastics box"

(a) (3) and (4), first lines: amend "6HH" to "6HH1";
second lines: insert "6HH2"

(b) (8): amend "6HH" to "6HH1".

Add new paragraph to read as follows:

"(9) Plastics receptacle with outer solid plastics box 6HH2; the relevant provisions of marginal 3531 (a), (d), (e) and (f) shall apply to the construction of the outer packaging."

3538 Replace existing paragraph (b) with the following:

"(b) Outer packaging

The following may be used:
steel drums, removable head (marginal 3520);
aluminium drums, removable head (marginal 3521);
steel jerricans, removable head (marginal 3522);
plywood drums (marginal 3523);
fibre drums (marginal 3525);
plastics drums, removable head (marginal 3526);
plastics jerricans, removable head (marginal 3526);
natural wood boxes (marginal 3527);
plywood boxes (marginal 3528);
reconstituted wood boxes (marginal 3529);
fibreboard boxes (marginal 3530);
plastics boxes (marginal 3531);
steel or aluminium boxes (marginal 3532)."

3540 (e) After "packagings" insert "(OA1)". Add a second sentence as follows:

"The closures of removable-head packagings (OA2) shall be so designed and fitted that they stay firmly closed and the packagings remain leakproof in normal conditions of carriage."

3555 (3) Twice replace "6HH" by "6HH1 and 6HH2".

3570 is deleted and replaced by existing marginal 3571.

ANNEX TO APPENDIX A.5

Section II - before Class 6.1, insert:

Item	Substance	Standard Liquid
"Class 5.1		
A.	Liquid oxidizing substances and their aqueous solutions.	
	1° Hydrogen peroxide and its solutions 9/	
	(b) Aqueous solutions with not less than 20% but not more than 60% hydrogen peroxide	Water
	(c) Aqueous solutions with not less than 8% but less than 20% hydrogen peroxide	Water
	3° (a) Perchloric acid with more than 50% but not more than 72% acid (mass).	Nitric acid
B.	Aqueous solutions of solid oxidizing substances.	
	11° (b) Calcium chlorate solution	Water
	Potassium chlorate solution	Water
	Sodium chlorate solution	water"

SECTION II - Class 8, C - Other corrosive substances, delete the text relating to item 62° and footnote 11/.

Add a footnote 9/: "9/ Test to be performed only with a vent".

Existing footnote 9/ and 10/ should be renumbered 10/ and 11/ respectively.

APPENDIX A.6

General conditions for the use of intermediate bulk containers (IBCs), types of IBCs, requirements relating to the construction of IBCs and test specifications for IBCs.

3600 "Intermediate Bulk Container" (IBC) means a rigid, semi-rigid or flexible portable packaging, other than those specified in Appendix A.5, that:

(a) has a capacity of not more than 3.0 m^3 (3,000 litres);

(b) is designed for mechanical handling;

(c) is resistant to the stresses produced in handling and transport as determined by the tests specified in this Appendix.

NOTE 1: The provisions of this Appendix apply to intermediate bulk containers (IBCs) the use of which is expressly authorized in the relevant classes for the carriage of certain dangerous substances.

NOTE 2: Tank containers which meet the provisions of Appendix B.1b are not considered to be intermediate bulk containers (IBCs).

NOTE 3: Intermediate bulk containers (IBCs) which meet the conditions of this Appendix are not considered to be containers for the purposes of ADR.

NOTE 4: The letters IBC only will be used in the rest of the text to refer to intermediate bulk containers.

Section 1: General conditions applicable to IBCs

3601 (1) IBCs shall be designed, manufactured and tested under a quality assurance programme which satisfies the competent authority, in order to ensure that each IBC meets the provisions of this Appendix.

(2) Every IBC shall correspond in all respects to its design type.

The competent authority may at any time require proof, by conducting tests in accordance with the provisions of this Appendix, that IBCs meet the requirements for design type tests.

(3) Before being filled and handed over for carriage, every IBC shall be inspected to ensure that it is free from corrosion, contamination or other damage and with regard to proper functioning of service equipment. Any IBC which shows signs of reduced strength as compared with the tested design type shall no longer be used or shall be so reconditioned that it is able to withstand the design type tests.

(4) Where two or more closure systems are fitted in series, that nearest to the substance being carried shall be closed first.

(5) During carriage, no dangerous residue shall adhere to the outside of the IBC.

3601 (cont'd) (6) Where overpressure may develop in an IBC through the emission of gas from the contents (as a result of temperature increase or other causes), the IBC may be fitted with a vent provided that the gas emitted will not cause any danger on account of its toxicity, its flammability, the quantity released, etc. The vent shall be so designed that, when the IBC is in the position in which it is intended to be carried, leakages of liquid and the penetration of foreign matter are prevented under normal conditions of carriage. However, a substance may be carried in such an IBC only where a vent is prescribed for that substance in the conditions of carriage of the relevant class.

(7) When IBCs are filled with liquids, sufficient ullage shall be left to ensure that no leakage of liquid and no permanent distortion of the IBC occurs as a result of expansion of the liquid, due to temperatures which may be attained during carriage.

For a filling temperature of 15°C, the maximum degree of filling shall be determined as follows, unless otherwise provided under a particular class:

Either (a)

Boiling point (initial boiling point) of the substance in °C	› 35 ‹ 60	› 60 ‹ 100	› 100 ‹ 200	› 200 ‹ 300	› 300
Degree of filling as a percentage of the capacity of the IBC	90	92	94	96	98

Or (b)

$$\text{Degree of filling} = \frac{98}{1 + \mathcal{A}\,(50 - t_F)} \text{ \% of the capacity of the IBC.}$$

In this formula, $\mathcal{A}$ represents the mean coefficient of cubic expansion of the liquid between 15°C and 50°C, that is to say, for a maximum rise in temperature of 35°C;

$\mathcal{A}$ is calculated according to the formula:

$$\mathcal{A} = \frac{d_{15} - d_{50}}{35 \times d_{50}}$$

d_{15} and d_{50} being the relative densities of the liquid at 15°C and 50°C and t_F the mean temperature of the liquid at the time of filling.

(8) When IBCs are used for the carriage of liquids with a flash-point of 55°C (closed cup) or lower, or powders liable to dust explosion, measures shall be taken to prevent a dangerous electrostatic discharge during filling and emptying.

3601 (cont'd) (9) The closure of IBCs containing wetted or diluted substances shall be such that the percentage of liquid (water, solvent or phlegmatizer) does not fall below the prescribed limits during carriage.

(10) Liquids shall be loaded only into rigid plastics IBCs or composite IBCs which have an adequate resistance to the internal pressure that may be developed under normal conditions of carriage. IBCs marked with the hydraulic test pressure as prescribed in marginal 3612 (2) shall be filled only with a liquid having a vapour pressure:

(a) such that the total gauge pressure in the packaging (i.e. the vapour pressure of the filling substance plus the partial pressure of air or other inert gases, less 100 kPa) at 55°C determined on the basis of a maximum degree of filling in accordance with paragraph (7) and a filling temperature of 15°C, will not exceed two-thirds of the marked test pressure; or

(b) at 50°C less than four-sevenths of the sum of the marked test pressure plus 100 kPa; or

(c) at 55°C less than two-thirds of the sum of the marked test pressure plus 100 kPa.

(11) During carriage, IBCs shall be securely fastened to or retained within the transport unit so as to prevent lateral or longitudinal movement or impact, and so as to provide adequate external support.

3602-3609

Section 2: Types of IBCs

Définitions

3610 (1) Subject to the particular provisions of each class, the IBCs mentioned below may be used:

Metal IBCs

Metal IBCs consist of a metal body together with appropriate service and structural equipment.

Flexible IBCs

Flexible IBCs consist of a body constituted of film, woven fabric or any other flexible material or combinations thereof, together with any appropriate service equipment and handling devices.

Rigid plastics IBCs

Rigid plastics IBCs consist of a rigid plastics body, which may have structural equipment together with appropriate service equipment.

3610 (cont'd)

Composite IBCs with plastics inner receptacle

Composite IBCs consist of structural equipment in the form of a rigid outer casing enclosing a plastics inner receptacle together with any service or other structural equipment. They are so constructed that the inner receptacle and outer casing once assembled form, and are used as, an integrated single unit to be filled, stored, transported or emptied as such.

Fibreboard IBCs

Fibreboard IBCs consist of a fibreboard body with or without separate top and bottom caps, if necessary an inner liner (but no inner packagings), and appropriate service and structural equipment.

Wooden IBCs

Wooden IBCs consist of a rigid or collapsible wooden body, together with an inner liner (but no inner packagings) and appropriate service and structural equipment.

(2) The following definitions apply to the IBCs listed in (1):

Body (for all categories of IBC other than composite IBCs) means the receptacle proper, including openings and their closures;

Service equipment (for all categories of IBC) means the filling and discharge devices and, according to the category of IBC, pressure relief or venting, safety, heating and heat-insulating devices and measuring instruments;

Structural equipment (for all categories of IBC other than flexible IBCs) means the reinforcing, fastening, handling, protective or stabilizing members of the body (including the base pallet for composite IBCs with plastics inner receptacle);

Maximum permissible gross mass (for all categories of IBC other than flexible IBCs) means the mass of the body, its service equipment and structural equipment and the maximum permissible load;

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

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

Woven plastics (for flexible IBCs) means a material made from stretched tapes or monofilaments of suitable plastics material;

Plastics (for composite IBCs with plastics inner receptacle), when used in connection with inner receptacles for composite IBCs, is taken to include other polymeric materials such as rubber, etc.;

3610 (cont'd) Handling device (for flexible IBCs) means any sling, loop, eye or frame attached to the body of the IBC or formed from a continuation of the IBC body material;

Liner (for fibreboard and wooden IBCs) means a separate tube or bag inserted in the body but not forming an integral part of it, including the closures of its openings.

Coding of IBC design types

3611 (1) Code system for IBCs

The code consists of:

- two Arabic numerals indicating the type of IBC as specified under (a) below;
- a capital letter or letters (Latin characters) as specified under (b) below, indicating the nature of the material (e.g. metal, plastics, etc.);
- where necessary, an Arabic numeral indicating the category of IBC within the type to which the IBC belongs.

For composite IBCs, two capital letters (Latin characters) shall be used. The first shall indicate the material of the inner receptacle of the IBC and the second that of the outer packaging of the IBC.

(a)

Type	For solids, loaded and/or discharged		for liquids
	by gravity	under pressure of more than 10 kPa (0.1 bar)	
Rigid	11	21	31
Semi-rigid	12	22	32
Flexible	13	-	-

(b) A. Steel (all types and surface treatments)
B. Aluminium
C. Natural wood
D. Plywood
F. Reconstituted wood
G. Fibreboard
H. Plastics material
L. Textile
M. Paper, multiwall
N. Metal (other than steel or aluminium).

3611 (cont'd) (2) The IBC code shall be followed in the marking by a letter indicating the groups of substances for which the design type is approved, i.e.:

Y for substances of packing groups II and III;

Z for substances of packing group III.

NOTE: For packing groups, see marginal 3511(2).

Marking

3612 (1) Primary marking

All IBCs built and intended for use in conformity with these provisions shall bear a durable and legible marking giving the following particulars:

(a) The United Nations packaging symbol 

(for metal IBCs on which the marking is stamped or embossed, the letters UN may be applied instead of the symbol);

(b) the code designating the type of IBC according to marginal 3611(1);

(c) a letter (Y or Z) designating the packing group(s) for which the design type has been approved;

(d) the month and year (last two digits) of manufacture;

(e) the mark 1/ of the State in which the approval was issued;

(f) the name or symbol of the manufacturer or any other identification of the IBC as specified by the competent authority;

(g) the stacking test load in kg;

(h) maximum permissible gross mass or, for flexible IBCs, maximum permissible load, in kg.

The primary marking required above shall be applied in the sequence of the subparagraphs above. The marking required by paragraph (2) and any further marking authorized by a competent authority shall be arranged so as to enable the various parts of the marking to be correctly identified.

1/ Distinguishing sign for motor vehicles in international traffic prescribed in the Vienna Convention on Road Traffic (1968).*

* United Nations, *Treaty Series*, vol. 1042, p. 17.

3612 (cont'd)

Examples of primary marking

(u) 11A/Y/0289 (n) NL/Mulder 007/5500/1500	Metal IBC made of steel for solids discharged for instance by gravity /for Packing Groups II and III/manufactured in February 1989 /approved by the Netherlands/ manufactured by Mulder in conformity with a design type to which the competent authority has allocated serial number 007/load used for the stacking test in kg/ maximum permissible gross mass in kg.
(u) 13H3/Z/0389 (n) F/Meunier 1713/1000/500	Flexible IBC for solids discharged for instance by gravity and made from woven plastics with a liner.
(u) 31H1/Y/0489 (n) GB/9099/10800/1200	Rigid plastics IBC for liquids, made from plastics with structural equipment to withstand the stacking load.
(u) 31HA1/Y/0589 (n) D/Muller/1683/10800/1200	Composite IBC for liquids with a rigid plastics inner receptacle and a steel outer casing.

(2) Additional marking 2/

For all categories of IBCs other than flexible IBCs:

(i) tare mass in kg 3/

For metal IBCs, rigid plastics IBCs and composite IBCs with plastics inner receptacle:

(j) capacity in litres 3/ at 20°C,

(k) date of last leakproofness test (month and year), if applicable,

(l) date of last inspection (month and year),

(m) maximum filling/discharge pressure in kPa (or in bar) 3/, if applicable.

For metal IBCs:

(n) body material and its minimum thickness in mm,

(o) serial number of the manufacturer,

2/ Each flexible IBC may also bear a pictogram indicating recommended lifting methods.

3/ The unit used shall be indicated.

3612 (cont'd) For rigid plastics IBCs and composite IBCs with plastics inner receptacle:

(p) Test pressure (gauge) in kPa (or bar) 3/, if applicable.

(3) After reconditioning an IBC, the reconditioner shall affix to it the following sequence of additional marks:

the mark 1/ of the State in whose territory the reconditioning was carried out;

the name or authorized symbol of the reconditioner;

the year of reconditioning and the letter "R".

(4) IBCs marked in accordance with this Appendix but approved in a State which is not a Contracting Party to ADR may also be used for carriage under ADR.

Certification

3613 The manufacturer shall certify, by affixing marking in accordance with this Appendix, that mass-produced IBCs correspond to the approved design type and that the conditions referred to in the approval certificate have been met.

Index of IBCs

3614 The codes corresponding to the various types of IBCs are as follows:

1. IBCs for solids loaded and discharged by gravity :

Type	Material	Category	Code	Marginals
11 rigid	steel	metal	11A	3622
	aluminium		11B	
	natural wood	wooden	11C	3627
	plywood		11D	
	reconstituted wood		11F	
	fibreboard	fibreboard	11G	3626
	plastics	rigid plastics (fitted with structural equipment)	11H1	3624
		rigid plastics (freestanding)	11H2	
		composite with plastics inner receptacle (rigid)	11HZ1 4/	3625
		composite with plastics inner receptacle (flexible)	11HZ2 4/	
	other metal	metal	11N	3622
12 semi-rigid		reserved		
13 flexible	woven plastics without coating or liner	flexible	13H1	3623
	woven plastics, coated		13H2	
	woven plastics with liner		13H3	
	woven plastics, coated and with liner		13H4	
	plastics film		13H5	
	textile without coating or liner		13L1	
	textile, coated		13L2	
	textile with liner		13L3	
	textile, coated and with liner		13L4	
	paper, multiwall		13M1	
	paper, multiwall water resistant		13M2	

4/ With regard to the letter Z, see marginal 3625 (1) (b)

3614 (cont'd) 2. IBCs for solids loaded or discharged under pressure of more than 10 kPa (0.1 bar)

Type	Material	Category	Code	Marginals
21 rigid	steel	metal	21A	3622
	aluminium		21B	
	plastics	rigid plastics (fitted with structural equipment)	21H1	3624
		rigid plastics (freestanding)	21H2	
		composite with plastics inner receptacle (rigid)	21HZ1 4/	3625
		composite with plastics inner receptacle (flexible)	21HZ2 4/	
	other metal	metal	21N	3622
22 semi-rigid		reserved		

3. IBCs for liquids

Type	Material	Category	Code	Marginals
31 rigid	steel	metal	31A	3622
	aluminium		31B	
	plastics	rigid plastics (fitted with structural equipment)	31H1	3624
		rigid plastics (freestanding)	31H2	
		composite with plastics inner receptacle (rigid)	31HZ1 4/	3625
		composite with plastics inner receptacle (flexible)	31HZ2 4/	
	other metal	metal	31N	3622
32 semi-rigid		reserved		

4/ With regard to the letter "Z", see marginal 3625(1)(b).

3615-
3620

Section 3: Construction requirements for IBCs

General provisions

3621 (1) IBCs shall be resistant to or adequately protected from deterioration due to the environment.

(2) IBCs shall be so constructed and closed that none of the contents can escape under normal conditions of carriage.

(3) IBCs and their closures shall be constructed of materials compatible with their contents, or be protected internally, so that they are not liable:

(a) to be attacked by the contents so as to make their use dangerous;

(b) to cause the contents to react or decompose, or form harmful or dangerous compounds with the IBCs.

(4) Gaskets, where used, shall be made of materials not subject to attack by the contents of the IBCs.

(5) All service equipment shall be so positioned or protected as to minimize the risk of escape of the contents owing to damage during handling and transport.

(6) IBCs, their attachments and their service and structural equipment shall be designed to withstand, without loss of contents, the internal pressure of the contents and the stresses of normal handling and transport. IBCs intended for stacking shall be designed for stacking. Any lifting or securing features of IBCs shall be of sufficient strength to withstand the normal conditions of handling and transport without gross distortion or failure and shall be so positioned that no undue stress is caused in any part of the IBC.

(7) Where an IBC consists of a body within a framework, it shall be so constructed that:

- the body does not chafe or rub against the framework so as to cause material damage to the body,
- the body is retained within the framework at all times,
- the items of equipment are fixed in such a way that they cannot be damaged if the connections between body and frame allow relative expansion or movement.

(8) Where a bottom discharge valve is fitted, it shall be capable of being made secure in the closed position and the whole discharge system shall be suitably protected from damage. Valves having lever closures shall be able to be secured against accidental opening and the open or closed position shall be readily apparent. For IBCs containing liquids, a secondary means of sealing the discharge aperture shall also be provided, e.g. by a blank flange or equivalent device.

(9) New, reused or reconditioned IBCs shall be capable of passing the prescribed tests.

Special provisions for metal IBCs

3622 (1) These provisions apply to metal IBCs intended for the carriage of solids or liquids. These IBCs are of the following types:

11A, 11B, 11N.

For solids which are loaded or discharged by gravity.

21A, 21B, 21N.

For solids which are loaded or discharged under a gauge pressure greater than 10 kPa (0.1 bar).

31A, 31B, 31N.

For liquids. Metal IBCs intended for the carriage of liquids and which comply with the provisions of this appendix shall not be used to carry liquids having a vapour pressure of more than 110 kPa (1.1 bar) at 50°C or more than 130 kPa (1.3 bar) at 55°C.

(2) Bodies shall be made of a suitable ductile metal of which the weldability has been fully demonstrated. Welds shall be skilfully made and afford complete safety.

(3) If contact between the substance carried and the material used for the construction of the body entails a progressive decrease in the thickness of the walls, this thickness shall be increased at manufacture by an appropriate amount. This extra thickness to allow for corrosion shall be added to the wall thickness as determined according to paragraph (7) (see also marginal 3621(3)).

(4) Care shall be taken to avoid damage by galvanic action due to the juxtaposition of dissimilar metals.

(5) Aluminium IBCs intended for the carriage of flammable liquids with a flash-point of not more than 55°C shall have no movable parts, such as covers, closures etc., made of unprotected steel liable to rust, which might cause a dangerous reaction by coming into frictional or percussive contact with the aluminium.

(6) Metal IBCs shall be made of metals which meet the following requirements:

(a) for steel the elongation at fracture, in per cent, shall not be less than $\frac{10{,}000}{Rm}$ with an absolute minimum of 20 %.

where Rm = guaranteed minimum tensile strength of the steel used in N/mm^2;

(b) for aluminium and its alloys the elongation at fracture, in per cent, shall not be less than $\frac{10{,}000}{6\ Rm}$ with an absolute minimum of 8 %.

3622 (cont'd) Specimens used to determine the elongation at fracture shall be taken transversely to the direction of rolling and be so secured that:

$$Lo = 5d$$

or

$$Lo = 5.65 \sqrt{A}$$

where: Lo = gauge length of the specimen before the test

d = diameter

A = cross-sectional area of test specimen.

(7) Minimum wall thickness:

(a) For a reference steel having a product of $Rm \times A_o = 10{,}000$, the wall thickness shall not be less than:

Capacity in m^3	Wall thickness in mm			
	Types: 11A, 11B, 11N		Types: 21A, 21B, 21N, 31A, 31B, 31N,	
	Unprotected	Protected	Unprotected	Protected
> 0.25 - ≤1.0	2.0	1.5	2.5	2.0
>1.0 - ≤2.0	2.5	2.0	3.0	2.5
>2.0 - ≤3.0	3.0	2.5	4.0	3.0

where: A_o = minimum elongation (as a percentage) of the reference steel used on fracture under tensile stress (see paragraph (6)).

(b) For metals other than the reference steel described in (a), the minimum wall thickness is calculated by the following equivalence formula:

$$e_1 = \frac{21.4 \times e_o}{\sqrt[3]{Rm_1 \times A_1}}$$

where:

e_1 = required equivalent wall thickness of the metal to be used (in mm);

e_o = required minimum wall thickness for the reference steel (in mm);

Rm_1 = guaranteed minimum tensile strength of the metal to be used (in N/mm^2);

A_1 = minimum elongation (as a percentage) of the metal to be used on fracture under tensile stress (see paragraph (6)).

3622 (cont'd) However, in no case shall the wall thickness be less than 1.5 mm.

(8) Pressure relief requirements

IBCs for liquids shall be capable of releasing a sufficient amount of vapour to ensure that, in the event of fire engulfment, no rupture of the body will occur. This can be achieved by conventional pressure relief devices or by other constructional means.

The start-to-discharge pressure shall not be higher than 65 kPa (0.65 bar) and no lower than the total gauge pressure experienced in the IBC (i.e. the vapour pressure of the filling substance plus the partial pressure of the air or other inert gases, minus 100 kPa (1 bar)) at 55°C, determined on the basis of a maximum degree of filling as defined in marginal 3601(7). The required relief devices shall be fitted in the vapour space.

Special provisions for flexible IBCs

3623 (1) These provisions apply to flexible IBCs intended for the carriage of solids. These IBCs are of the following types:

13H1 woven plastics without coating or liner
13H2 woven plastics, coated
13H3 woven plastics with liner
13H4 woven plastics, coated and with liner
13H5 plastics film
13L1 textile without coating or liner
13L2 textile, coated
13L3 textile with liner
13L4 textile, coated and with liner
13M1 paper, multiwall
13M2 paper, multiwall, water resistant.

(2) Bodies shall be manufactured from suitable materials. The strength of the material and the construction of the flexible IBC shall be appropriate to its capacity and its intended use.

(3) All materials used in the construction of flexible IBCs of types 13M1 and 13M2 shall, after complete immersion in water for not less than 24 hours, retain at least 85% of the tensile strength as measured originally on the material conditioned to equilibrium at 67% relative humidity or less.

(4) Seams shall be formed by stitching, heat sealing, glueing or any equivalent method. All stitched seam-ends shall be secured.

(5) Flexible IBCs shall provide adequate resistance to ageing and degradation caused by ultraviolet radiation, climatic conditions or the substance contained, thereby rendering them appropriate to their intended use.

3623 (cont'd) (6) For plastics flexible IBCs, where protection against ultraviolet radiation is required, it shall be provided by the addition of carbon black or other suitable pigments or inhibitors. These additives shall be compatible with the contents and remain effective throughout the life of the body. Where use is made of carbon black, pigments or inhibitors other than those used in the manufacture of the tested design type, retesting may be waived if changes in the carbon black content, the pigment content or the inhibitor content do not adversely affect the physical properties of the material of construction.

(7) Additives may be incorporated into the material of the body to improve the resistance to ageing or to serve other purposes, provided that these do not adversely affect the physical or chemical properties of the material.

(8) No material recovered from used receptacles shall be used in the manufacture of IBC bodies. Production residues or scrap from the same manufacturing process may, however, be used. Component parts such as fittings and pallet bases may also be used, provided such components have not been damaged in any way in previous use.

(9) When filled, the ratio of height to width shall be not more than 2:1.

Special provisions for rigid plastics IBCs

3624 (1) These provisions apply to rigid plastics IBCs intended for the carriage of solids or liquids. These IBCs are of the following types:

11H1 for solids which are loaded and discharged by gravity, fitted with structural equipment designed to withstand the whole load when IBCs are stacked,

11H2 for solids which are loaded and discharged by gravity, freestanding,

21H1 for solids which are loaded or discharged under pressure of more than 10 kPa (0.1 bar), fitted with structural equipment designed to withstand the whole load when IBCs are stacked,

21H2 for solids which are loaded or discharged under pressures of more than 10 kPa (0.1 bar), freestanding,

31H1 for liquids, fitted with structural equipment designed to withstand the whole load when IBCs are stacked,

31H2 for liquids, freestanding.

(2) The body shall be manufactured from suitable plastics material of known specifications and be of adequate strength in relation to its capacity and its intended use. The material shall be adequately resistant to ageing and to degradation caused by the substance contained or, where relevant, by ultraviolet radiation. Any permeation of the substance contained shall not constitute a danger under normal conditions of transport.

3624 (cont'd) (3) Where protection against ultraviolet radiation is required, it shall be provided by the addition of carbon black or other suitable pigments or inhibitors. These additives shall be compatible with the contents and remain effective throughout the life of the body. Where use is made of carbon black, pigments or inhibitors, other than those used in the manufacture of the tested design type, retesting may be waived if changes in the carbon black content, the pigment content or the inhibitor content do not adversely affect the physical properties of the material of construction.

(4) Additives may be incorporated in the material of the body to improve the resistance to ageing or to serve other purposes, provided that these do not adversely affect the physical or chemical properties of the material.

(5) No used material other than production residues or regrind from the same manufacturing process may be used in the manufacture of rigid plastics IBCs.

(6) Rigid plastics IBCs for liquids shall be capable of releasing a sufficient amount of vapour to ensure that no rupture of the body will occur. This can be achieved by conventional pressure relief devices or by other constructional means. The start-to-discharge pressure shall not be higher than the pressure used in the hydraulic pressure test.

(7) The permitted period of use of rigid plastics IBCs for the carriage of dangerous goods shall be five years from the date of their manufacture except where the conditions for carriage of the various classes prescribe a shorter period of use.

Special provisions for composite IBCs with plastics inner receptable

3625 (1) These provisions apply to composite IBCs intended for the carriage of solids or liquids. These IBCs are of the following types:

(a) 11HZ1 for solids loaded and discharged by gravity, fitted with a rigid plastics inner receptacle;

11HZ2 for solids loaded and discharged by gravity, fitted with a flexible plastics inner receptacle;

21HZ1 for solids loaded or discharged under pressure of more than 10 kPa (0.1 bar), fitted with a rigid plastics inner receptacle;

21HZ2 for solids loaded or discharged under pressure of more than 10 kPa (0.1 bar), fitted with a flexible plastics inner receptacle;

31HZ1 for liquids, fitted with a rigid plastics inner receptacle;

31HZ2 for liquids, fitted with a flexible plastics inner receptacle.

(b) This code shall be completed by replacing the letter Z with a capital letter in accordance with marginal 3611(1)(b) to indicate the nature of the material used for the outer casing.

3625 (cont'd)

(2) General

(a) The inner receptacle is not intended to perform a containment function without its outer casing.

(b) The outer casing normally consists of rigid material formed so as to protect the inner receptacle from physical damage during handling and transport but is not intended to perform the containment function; it includes the base pallet where appropriate.

(c) A composite IBC with a fully enclosing outer casing shall be so designed that the integrity of the inner container may be readily assessed following the leakproofness and hydraulic tests.

(3) Inner receptacle

The same requirements as provided for in marginal 3624 (2) to (6) for rigid plastics IBCs apply to the inner receptacle, on the understanding that, in this case, the requirements applicable to the body of rigid plastics IBCs are applicable to the inner receptacle of composite IBCs.

(4) Outer casing

(a) The strength of the material and the construction of the outer casing shall be appropriate to the capacity of the composite IBC and its intended use.

(b) The outer casing shall be free of any projection that might damage the inner receptacle.

(c) Full-walled or mesh-formed metal outer casings shall be constructed of a suitable material of adequate thickness.

(d) Outer casings of natural wood shall be of well seasoned wood, commercially dry and free from defects that would materially lessen the strength of any part of the casing. The tops and bottoms may be made of water-resistant reconstituted wood such as hardboard, particle board or other suitable type.

(e) Outer casings of plywood shall be made of well seasoned rotary cut, sliced or sawn veneer, commercially dry and free from defects that would materially lessen the strength of the casing. All adjacent plies shall be glued with water-resistant adhesive. Other suitable materials may be used with plywood for the construction of casings. Casings shall be firmly nailed or secured to corner posts or ends or be assembled by equally suitable devices.

(f) The walls of outer casings of reconstituted wood shall be made of water-resistant reconstituted wood such as hardboard, particle board or other suitable type. Other parts of the casings may be made of other suitable material.

3625 (cont'd)

(g) For fireboard outer casings, strong and good quality solid or double-faced corrugated fibreboard (single or multiwall) shall be used appropriate to the capacity of the casing and to its intended use. The water resistance of the outer surface shall be such that the increase in mass, as determined in a test carried out over 30 minutes by the Cobb method of determining water absorption, is not greater than 155 g/m^2 - see ISO International Standard 535-1976 (E). It shall have proper bending qualities. Fibreboard shall be cut, creased without scoring, and slotted so as to permit assembly without cracking, surface breaks or undue bending. The fluting of corrugated fibreboard shall be firmly glued to the facings.

(h) The ends of fibreboard casings may have a wooden frame or be entirely of wood. Reinforcements of wooden battens may be used.

(i) Manufacturing joins in the body of fibreboard casings shall be taped, lapped and glued, or lapped and stitched with metal staples. Lapped joins shall have an appropriate overlap. Where closing is effected by glueing or taping, a water-resistant adhesive shall be used.

(j) Where the outer casing is of plastics material, the relevant provisions of marginal 3624 (2) to (5) for rigid plastics IBCs apply, on the understanding that, in this case, the requirements applicable to the body of rigid plastics IBCs are applicable to the outer casing of composite IBCs.

(5) Other structural equipment

(a) Any integral pallet base forming part of an IBC or any detachable pallet shall be suitable for mechanical handling of the IBC filled to its maximum permissible gross mass.

(b) The pallet or integral base shall be designed so as to avoid any protrusion of the base of the IBC that might be liable to damage in handling.

(c) The outer casing shall be secured to any detachable pallet to ensure stability in handling and transport. Where a detachable pallet is used, its top surface shall be free from sharp protrusions that might damage the IBC.

(d) Strengthening devices such as timber supports to increase stacking performance may be used, but shall be external to the inner receptacle.

(e) Where IBCs are intended for stacking the bearing surface shall be such as to distribute the load in a safe manner. Such IBCs shall be designed so that the load is not supported by the inner receptacle.

(6) The permitted period of use of composite IBCs for the carriage of dangerous goods shall be five years from the date of their manufacture, except where the conditions for carriage of the various classes prescribe a shorter period of use.

Special provisions for fibreboard IBCs

3626 (1) These provisions apply to fibreboard IBCs for the carriage of solids which are loaded and discharged by gravity. Fibreboard IBCs are of the following type: 11G.

(2) Fibreboard IBCs shall not incorporate top lifting devices.

(3) Body

(a) Strong and good quality solid or double-faced corrugated fibreboard (single or multiwall) shall be used, appropriate to the capacity of the IBC and its intended use. The water resistance of the outer surface shall be such that the increase in mass, as determined in a test carried out over a period of 30 minutes by the Cobb method of determining water absorption, is not greater than 155 g/m^2 - see ISO Standard 535 - 1976 (E). The fibreboard shall have proper bending qualities. It shall be cut, creased without scoring, and slotted so as to permit assembly without cracking, surface breaks or undue bending. The fluting of corrugated fibreboard shall be firmly glued to the facings.

(b) The walls, including top and bottom, shall have a minimum puncture resistance of 15 J measured according to ISO International Standard 3036-1975.

(c) Manufacturing joins in the body of IBCs shall be made with an appropriate overlap and shall be taped, glued, stitched with metal staples, or fastened by other means at least equally effective. Where joins are effected by glueing or taping, a water-resistant adhesive shall be used. Metal staples shall pass completely through all pieces to be fastened and be formed or protected so that any inner liner cannot be abraded or punctured by them.

(4) Liner

The liner shall be made of a suitable material. The strength of the material used and the construction of the liner shall be appropriate to the capacity and intended use of the IBC. Joins and closures shall be siftproof and capable of withstanding pressures and impacts liable to occur under normal conditions of handling and transport.

(5) Structural equipment

(a) Any integral pallet base forming part of an IBC or any detachable pallet shall be suitable for mechanical handling of the IBC filled to its maximum permissible mass.

(b) The pallet or integral base shall be designed so as to avoid any protrusion of the base of the IBC that might be liable to damage in handling.

(c) The body shall be secured to any detachable pallet to ensure stability in handling and transport. Where a detachable pallet is used, its top surface shall be free from sharp protrusions that might damage the IBC.

(d) Strengthening devices such as timber supports to increase stacking performance may be used but shall be external to the liner.

(e) Where IBCs are intended for stacking, the bearing surface shall be such as to distribute the load in a safe manner.

Special provisions for wooden IBCs

3627 (1) These provisions apply to wooden IBCs for the carriage of solids which are loaded and discharged by gravity. Wooden IBCs are of the following types:

11C Natural wood with inner liner
11D Plywood with inner liner
11F Reconstituted wood with inner liner.

(2) Wooden IBCs shall not incorporate top lifting devices.

(3) Body

(a) The strength of the materials used and the method of construction shall be appropriate to the capacity and intended use of the IBC.

(b) If bodies are of natural wood, this shall be well seasoned, commercially dry and free from defects that would materially lessen the strength of any part of the IBC. Each part of the IBC shall consist of one piece or be equivalent thereto. Parts are considered equivalent to one piece when a suitable method of glued assembly (as for instance Lindermann joint, tongue and groove joint, ship-lap or rabbet joint), butt joint with at least two corrugated metal fasteners at each joint, or other methods at least equally effective, are used.

(c) If bodies are of plywood, this shall be at least 3-ply. It shall be made of well-seasoned rotary cut, sliced or sawn veneer, commercially dry and free from defects that would materially lessen the strength of the body. All adjacent plies shall be glued with water-resistant adhesive. Other suitable materials may be used with plywood for the construction of the body.

(d) Bodies of reconstituted wood shall be made of water-resistant reconstituted wood such as hardboard, particle board or other suitable type.

(e) IBCs shall be firmly nailed or secured to corner posts or ends or be assembled by equally suitable devices.

(4) Liner

The liner shall be made of a suitable material. The strength of the material used and the construction of the liner shall be appropriate to the capacity and intended use of the IBC. Joins and closures shall be siftproof and capable of withstanding pressures and impacts liable to occur under normal conditions of handling and transport.

(5) Structural equipment

(a) Any integral pallet base forming part of an IBC or any detachable pallet shall be suitable for mechanical handling of the IBC filled to its maximum permissible gross mass.

3627 (cont'd)

(b) The pallet or integral base shall be designed so as to avoid any protrusion of the base of the IBC that might be liable to damage in handling.

(c) The body shall be secured to any detachable pallet to ensure stability in handling and transport. The top surface of the detachable pallet shall be free from sharp protrusions that might damage the IBC.

(d) Strengthening devices such as timber supports to increase stacking performance may be used but shall be external to the liner.

(e) Where IBCs are intended for stacking, the bearing surface shall be such as to distribute the load in a safe manner.

3628-3649

Section 4: Test requirements for IBCs

A. Design type tests

General requirements

3650 (1) The design type of each IBC shall be tested and approved by the competent authority or by a body designated by that authority.

(2) For each design type, a single IBC shall successfully be subjected to the tests listed in (5) below in the order mentioned in the table and according to the provisions specified in marginals 3652 to 3660, (and, for flexible IBCs, in accordance with the procedures established by the competent authority) before such an IBC is used. An IBC design type is defined by the design, size, material and thickness, manner of construction and means of filling and discharging but may include various surface treatments. It also includes IBCs which differ from the design type only in their lesser external dimensions.

The competent authority may nevertheless authorize the selective testing of IBCs which differ from a type already tested only in minor respects, for example, slight reductions in the external dimensions.

(3) Tests shall be carried out on IBCs prepared as for dispatch. IBCs shall be filled as indicated for the various tests. The substances to be carried in the IBCs may be replaced by other substances, except where this would invalidate the results of the tests. For solids, if another substance is used, it shall have the same physical characteristics (mass, grain size, etc.) as the substance to be carried. It is permissible to use additives, such as bags of lead shot, to achieve the requisite total package mass, provided they are placed so that the test results are not affected.

(4) In the drop tests for liquids, if another substance is used, its relative density and viscosity shall be similar to those of the substance to be carried. Water may also be used for the liquid drop test under the following conditions:

3650 (cont'd)

(a) if the substances to be carried have a relative density not exceeding 1.2, the drop heights shall be those shown under the relevant sections for the various types of IBC;

(b) if the substances to be carried have a relative density exceeding 1.2, the drop heights shall be those shown in the relevant sections for the various types of IBC multiplied by the ratio of the relative density of the substance to be carried, rounded up to the first decimal, and divided by 1.2, i.e.,

$$\frac{\text{relative density}}{1.2} \times \text{specified drop height}$$

(5) Tests required for every IBC design type.

Each X indicates that the IBC category shown at the head of the column has to be subjected to the test indicated on the line in question, in the order listed.

	Metal IBCs	Flexible IBCs	Rigid plastics IBCs	Composite IBCs with plastics inner receptacle	Fibre-board IBCs	Wooden IBCs
Bottom lift	X1/		X	X	X	X
Top lift	X1/	X4/	X1/	X1/		
Tear		X				
Stacking	X	X	X	X	X	X
Leakproofness	X5/		X5/	X5/		
Internal hydraulic pressure	X2/		X2/	X2/		
Drop	X3/	X	X	X3/	X	X
Topple		X				
Righting		X4/				

1/ For IBCs designed to be handled in this way.

2/ The internal hydraulic pressure test is not required for IBCs of type 11A, 11B, 11N, 11H1, 11H2, 11HZ1 or 11HZ2.

3/ Another IBC of the same design may be used for the drop test.

4/ When the IBCs are designed to be lifted from the top or from the side.

5/ The leakproofness test is not required for IBCs of type 11A, 11B, 11N, 11H1, 11H2, 11HZ1 or 11HZ2.

Preparation of IBCs for testing

3651 (1) Flexible IBCs, fibreboard IBCs and composite IBCs with fibreboard outer casing

Paper IBCs, fibreboard IBCs and composite IBCs with fibreboard outer casings shall be conditioned for at least 24 hours in an atmosphere having a controlled temperature and relative humidity (r.h.). There are three options, one of which shall be chosen. The preferred atmosphere is 23° C± 2°C and 50% ± 2% r.h. The other two options are 20° C± 2°C and 65% ± 2% r.h. or 27°C ± 2°C and 65% ± 2% r.h.

Note: These values correspond to average values. In the short term the relative humidity values may vary by ± 5% without this having an influence on the test.

(2) Rigid plastics IBCs and composite IBCs with plastics inner receptacle

Steps shall be taken to ascertain that the plastics material used in the manufacture of rigid plastics IBCs and composite IBCs complies with the provisions of marginal 3624.

To prove there is sufficient chemical compatibility with the contained goods, the sample IBC shall be subjected to a preliminary storage for six months, during which the samples remain filled with the substances they are intended to contain or with substances which are known to have at least as severe a stress-cracking, weakening or molecular degradation effect on the plastics materials in question, and after which the samples shall be subjected to the applicable tests listed in marginal 3650 (5).

Where the behaviour of the plastics material has been established by other means, the above compatibility test may be dispensed with. Such procedures shall be at least equivalent to the above compatibility test and be recognized by the competent authority.

Testing procedures

3652 Bottom lift test

(1) Applicability

For all types of IBC which are fitted with means of lifting from the base.

(2) Preparation of IBCs for test

The IBC shall be filled to 1.25 times its maximum permissible gross mass, the load being evenly distributed.

(3) Method of testing

The IBC shall be raised and lowered twice by a lift truck with the forks centrally positioned and spaced at three quarters of the dimension of the side of entry (unless the points of entry are fixed). The forks shall penetrate to three quarters of the direction of entry. The test shall be repeated from each possible direction of entry.

3652 (cont'd) (4) Criteria for passing the test

No permanent deformation which renders the IBC (including the pallet base for composite IBCs with plastics inner receptacle, fibreboard IBCs and wooden IBCs) unsafe for transport and no loss of contents.

3653 Top lift test

(1) Applicability

For all types of IBC which are fitted with means of lifting from the top or, where appropriate, from the side for flexible IBCs.

(2) Preparation of IBCs for test

Metal IBCs, rigid plastics IBCs and composite IBCs with plastics inner receptacle

The IBC shall be filled to twice its maximum permissible gross mass.

Flexible IBCs

The IBC shall be filled to six times its maximum permissible load, the load being evenly distributed.

(3) Method of testing

Metal and flexible IBCs:

The IBC shall be lifted in the manner for which it is designed until it is clear of the floor and maintained in that position for a period of five minutes.

For flexible IBCs other methods of top lift testing and preparation at least equally effective may be used.

Rigid plastics IBCs and composite IBCs with plastics inner receptacle:

The IBC shall be lifted by each pair of diagonally opposite lifting devices, so that the hoisting forces are applied vertically, for a period of five minutes; and

The IBC shall be lifted by each pair of diagonally opposite lifting devices, so that the hoisting forces are applied towards the centre at 45° to the vertical, for a period of five minutes.

(4) Criteria for passing the test

Metal IBCs, rigid plastics IBCs, composite IBCs with plastics inner receptacle:

No permanent deformation which renders the IBC (including the pallet base for composite IBCs) unsafe for transport and no loss of contents.

3653 (cont'd) Flexible IBCs:

No damage to the IBC or its lifting devices which renders the IBC unsafe for transport or handling.

3654 Tear test

(1) Applicability

For all types of flexible IBCs.

(2) Preparation of IBCs for test

The IBC shall be filled to not less than 95% of its capacity and to its maximum permissible load, the load being evenly distributed.

(3) Method of testing

Once the IBC is placed on the ground, a 100 mm knife score, completely penetrating the wall of a wide face, is made at a 45° angle to the principal axis of the IBC, halfway between the bottom surface and the top level of contents. The IBC shall then be subjected to a uniformly distributed superimposed load equivalent to twice the maximum permissible load. The load shall be applied for at least five minutes.

IBCs which are designed to be lifted from the top or the side shall then, after removal of the superimposed load, be lifted clear of the floor and maintained in that position for a period of five minutes. Other equivalent methods may be used.

(4) Criterion for passing the test

The cut shall not propagate more than 25% of its original length.

3655 Stacking test

(1) Applicability

For all types of IBC.

(2) Preparation of IBCs for test

All categories of IBC other than flexible IBCs:

The IBC shall be filled to its maximum permissible gross mass.

Flexible IBCs:

The IBC shall be filled to not less than 95% of its capacity and to its maximum permissible load, the load being evenly distributed.

(3) Method of testing

The IBC shall be placed on its base on level hard ground and subjected to a uniformly distributed superimposed test load (see (4) below).

3655
(cont'd)

Categories and Types of IBC	Testing time
Metal IBCs	5 minutes
Flexible IBCs, rigid plastics IBCs of types 11H1, 21H1 and 31H1, Composite IBCs with plastics inner receptacle of types 11HZ1, 21HZ1 and 31HZ1, Fibreboard IBCs, wooden IBCs	24 hours
Rigid plastics IBCs of types 11H2, 21H2 and 31H2, Composite IBCs with plastics inner receptacle of types 11HZ2, 21HZ2 and 31HZ2	28 days at 40°C

For all categories of IBC other than metal IBCs, the superimposed test load shall be applied by one of the following methods:

- one or more IBCs of the same type loaded to their maximum permissible gross mass (maximum permissible load in the case of flexible IBCs) are stacked on the test IBC;

- appropriate weights are loaded on to a flat plate or a reproduction of the base of the IBC, which is placed on the test IBC.

(4) Calculation of superimposed test load

The load to be placed on the IBC shall be at least 1.8 times the combined maximum permissible gross mass of the number of similar IBCs that may be stacked on top of the IBC during carriage.

(5) Criteria for passing the test

- IBCs other than flexible IBCs:

No permanent deformation which renders the IBC (including the pallet base for composite IBCs, fibreboard IBCs or wooden IBCs) unsafe for transport and no loss of contents.

- Flexible IBCs:

No deterioration of the body which renders the IBC unsafe for transport and no loss of contents.

3656 Leakproofness test

(1) Applicability

For all types of metal IBC and for types of plastics IBC and composite IBCs with plastics inner receptacle for the transport of solids loaded or discharged under pressure or for the transport of liquids.

3656 (cont'd) (2) Preparation of IBCs for test

Vented closures shall either be replaced by similar non-vented closures or the vent shall be sealed. In addition, for metal IBCs, the design type test shall be carried out before the fitting of any thermal insulation equipment.

(3) Method of testing and pressure to be applied

The test shall be carried out for a period of at least 10 minutes using air at a constant gauge pressure of not less than 20 kPa (0.2 bar). The airtightness of the IBC shall be determined by a suitable method such as the air-pressure differential test or by immersing the IBC in water. In the latter case a correction factor shall be applied for the hydrostatic pressure. Other methods at least as effective may be used for rigid plastics IBCs and for composite IBCs.

(4) Criterion for passing the test

No leakage of air.

3657 Internal (hydraulic) pressure test

(1) Applicability

For IBCs of types:

- 21A, 21B, 21N, 31A, 31B, 31N
- 21H1, 21H2, 31H1, 31H2
- 21HZ1, 21HZ2, 31HZ1, 31HZ2.

(2) Preparation of IBCs for test

Pressure relief devices shall be removed and their apertures plugged, or shall be rendered inoperative. In addition, for metal IBCs, the test shall be carried out before the fitting of any thermal insulation equipment.

(3) Method of testing

The test shall be carried out for a period of at least 10 minutes applying a hydraulic pressure not less than that indicated in (4). The IBCs shall not be mechanically restrained during the test.

(4) Pressures to be applied

(a) Metal IBCs:

1. For all IBCs of types 21A, 21B, 21N, 31A, 31B, 31N, a gauge pressure of 200 kPa (2 bar);

2. As a supplementary test for IBCs of types 31A, 31B, 31N, for liquids, a 65 kPa (0.65 bar) gauge pressure. This test shall be performed before the test in accordance with (a) 1.

3657 (cont'd) (b) Rigid plastics IBCs and composite IBCs with inner plastics receptacle:

1. For IBCs of types 21H1, 21H2, 21HZ1 and 21HZ2: a gauge pressure of 75 kPa (0.75 bar)

2. For IBCs of types 31H1, 31H2, 31HZ1 and 31HZ2: whichever is the greater of the values under (i) or (ii):

(i) The total gauge pressure measured in the IBC (i.e. the vapour pressure of the filling substance and the partial pressure of the air or other inert gases, minus 100 kPa) at 55°C multiplied by a safety factor of 1.5; this total gauge pressure shall be determined on the basis of a maximum degree of filling in accordance with 3601(7) and a filling temperature of 15°C; or

1.75 times the vapour pressure at 50°C of the substance to be carried minus 100 kPa, but with a minimum test pressure of 100 kPa; or

1.5 times the vapour pressure at 55°C of the substance to be carried minus 100 kPa; but with a minimum test pressure of 100 kPa;

(ii) twice the static pressure of the substance to be carried, with a minimum of twice the static pressure of water.

(5) Criteria for passing the test(s)

- Metal IBCs:

For all IBCs of types 21A, 21B, 21N, 31A, 31B, 31N when subjected to the pressure test specified in (4) (a) 1. above, no leakage.

For IBCs of types 31A, 31B and 31N, for liquids, when subjected to the pressure test specified in (4) (a) 2. above, neither permanent deformation which would render the IBC unsafe for transport, nor leakage.

- Rigid plastics IBCs and composite IBCs:

Neither permanent deformation which would render the IBC unsafe for transport, nor loss of contents.

3658 Drop test

(1) Applicability

For all types of IBC.

(2) Preparation of IBCs for test

The IBC shall be filled:

3658 (cont'd)

For solids,

to not less than 95% of its capacity,

For liquids,

to not less than 98% of its capacity in the case of metal IBCs or rigid plastics IBCs, and to not less than 90% of its capacity in the case of composite IBCs with plastics inner receptacle.

The IBC shall further be filled to its maximum permissible load in accordance with the design type.

For metal IBCs, rigid plastics IBCs and composite IBCs with plastics inner receptacle, pressure relief devices shall be removed and their apertures plugged, or shall be rendered inoperative.

For rigid plastics IBCs and composite IBCs with plastics inner receptacle, testing shall be carried out when the temperature of the test sample and its contents has been reduced to -18°C or lower. Where test samples are prepared in this way, the conditioning specified in 3651(2) may be waived.

Test liquids shall be kept in the liquid state, if necessary by the addition of anti-freeze.

This conditioning may be disregarded if the ductility and tensile strength of the materials in question are not significantly reduced at -18°C or lower.

(3) Method of testing

The IBC shall be dropped on to a rigid, non-resilient, smooth, flat and horizontal surface, on its base (for flexible IBCs) or in such a manner as to ensure that the point of impact is on that part of the base of the IBC considered to be the most vulnerable (for all other types of IBC).

(4) Drop height

Packing Group II	Packing Group III
1.2 m	0.8 m

(5) Criteria for passing the test

- All IBCs:

No loss of contents.

- IBCs other than metal IBCs:

A slight discharge from closures (or stitch holes in the case of flexible IBCs) upon impact shall not be considered to be a failure of the IBC, provided that no further leakage occurs.

3659 Topple test

(1) Applicability

For all types of IBC.

(2) Preparation of IBCs for test

The IBC shall be filled to not less than 95% of its capacity and to its maximum permissible load, the load being evenly distributed.

(3) Method of testing

The IBC shall be caused to topple on to any part of its top on to a rigid, non-resilient, smooth, flat and horizontal surface.

(4) Topple height

Packing Group II	Packing Group III
1.2 m	0.8 m

(5) Criteria for passing the test

No loss of contents. A very slight discharge, e.g. from closures or stitch holes, upon impact shall not be considered to be a failure of the IBC, provided that no further leakage occurs.

3660 Righting test

(1) Applicability

For all IBCs designed to be lifted from the top or side.

(2) Preparation of IBCs for test

The IBC shall be filled to not less than 95% of its capacity and to its maximum permissible load, the load being evenly distributed.

(3) Method of testing

The IBC, lying on its side, shall be lifted at a speed of at least 0.1 m/s to upright position, clear of the floor, by one lifting device, or by two lifting devices when four are provided.

(4) Criterion for passing the test

No damage to the IBC or its lifting devices which renders the IBC unsafe for transport or handling.

Test report

3661 A test report shall be prepared which shall give at least the following particulars:

1. Testing body;

3661 (cont'd)

2. Applicant;

3. Manufacturer of the IBC;

4. Description of the IBC (e.g. distinctive features such as material, inner lining, dimensions, wall thickness, mass, closures, colouring of plastics materials);

(For composite IBCs with plastics inner receptacle, fibreboard IBCs and wooden IBCs, if detachable pallets are used in the tests, the report shall include a technical description of the pallets used.)

5. Design drawing of IBC and closures (if necessary, photographs);

6. Method of manufacture;

7. Actual capacity;

8. Permissible filling substances (in particular, details of relative densities and vapour pressures at 50°C or 55°C);

9. Drop height;

10. Test pressure in leakproofness test;

11. Test pressure in internal pressure (hydraulic) test;

12. Test load in stacking test;

13. Bottom lift test, if prescribed;

14. Top lift test, if prescribed;

15. Topple test, if prescribed;

16. Tear test, if prescribed;

17. Righting test, if prescribed;

18. Test results;

19. Marking of the IBC and details to identify closures.

A copy of the test report shall be retained by the competent authority.

B. Tests and inspection for every metal IBC, rigid plastics IBC and composite IBC with plastics inner receptable

Initial and periodic tests

3662 (1) All metal IBCs of type 21A, 21B, 21N, 31A, 31B and 31N, all rigid plastics IBCs of type 21H1, 21H2, 31H1 and 31H2 and all composite IBCs with plastics inner receptacle of type 21HZ1, 21HZ2, 31HZ1 and 31HZ2 shall be subjected to the leakproofness test according to marginal 3656 before they are used for transport for the first time.

3662 (cont'd) (2) The leakproofness test referred to in (1) shall be repeated

- at least once every two and a half years

- after any reconditioning.

(3) The results of the tests shall be entered in the test reports to be kept by the owner of the IBC.

Inspection

3663 (1) All metal IBCs, all rigid plastics IBCs and all composite IBCs with plastics inner receptacle shall be inspected to the satisfaction of the competent authority before they are put into service (and subsequently at least every five years for metal IBCs), with regard to:

- conformity to design type including marking;

- internal and external condition;

- proper functioning of service equipment.

For metal IBCs, thermal insulation need be removed only to the extent necessary for a proper examination of the IBC body.

(2) All IBCs referred to in (1) shall be visually inspected to the satisfaction of the competent authority after not more than two and a half years, with reference to the external condition of the IBC and the proper functioning of service equipment.

For metal IBCs, the insulation need be removed only if this is essential for a proper examination of the IBC body.

(3) Every inspection shall be the subject of a report which shall be kept by the owner at least until the following inspection date.

(4) If the structural characteristics of an IBC have been impaired by a violent impact (for example, an accident) or other cause, the IBC shall be repaired and subjected to the leakproofness test according to marginal 3656, if it is required for the design type, and to the inspection prescribed in paragraph (1) above.

3664–3699

APPENDIX A.7

3700 Amend Table I as follows:

Below the first line for Gadolinium (64), add:
"^{148}Gd 3 80 3 x 10^{-4} 8 x 10^{-3}"

Above the first line for Potassium (19) add
"^{40}K Potassium (19) 0.6 10 0.6 10"
and delete "Potassium (19)" from the following line.

3755 Amend to read as follows:

"Type B(U) and type B(M) packagings and packagings containing fissile material which do not fully conform to the provisions of this Appendix but which nevertheless could be used in accordance with the provisions of ADR applicable on 31 December 1989 for the corresponding material of Class 7 may still be used under the following conditions for the carriage of this material:

a) multilateral approval shall be required on the expiry of the unilateral approval; and"

b) (remainder unchanged).

APPENDIX A.9

3900 (1) First sentence amend to read:

"Labels Nos. 1, 1.4, 1.5, 01, 2, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 05, 6.1, ..."(remainder unchanged).

Third sentence, add at the end:

"(see also marginal 2224 (6))".

3901 (2) Paragraph deleted; (3) and (4) become (2) and (3).

3902 Delete label No. 5 and the text for No. 2. Insert the following labels:

"No. 01	(black on orange background, bomb blast in upper half)	liable to explosion
No. 2	(gas cylinder, black or white, on green background, small figure "2" in bottom corner)	non-flammable non-toxic gas
No. 5.1	(flame over a circle, black on yellow background, small figure "5.1" in bottom corner)	oxidizing substance
No. 5.2	(flame over a circle, black on yellow background, small figure "5.2" in bottom corner)	organic peroxide, risk of fire
No. 05	(flame over a circle, black on yellow background)	fire-intensifying risk"

Add labels 01, 2 (twice), 5.1, 5.2 and 05 to the plate of illustrations and delete the existing label 5.

ANNEX B

PROVISIONS CONCERNING TRANSPORT EQUIPMENT AND TRANSPORT OPERATIONS

10 001 (3) Insert the following paragraph (3):

"(3) In article 1(c) of ADR the word "vehicles" need not refer to one and the same vehicle. An international transport operation may be performed by several different vehicles provided that the operation takes place on the territory of at least two Contracting Parties to ADR between the consignor and the consignee indicated in the transport document."

PART I

10 010 Delete "2431a". Insert "2551a".

10 011 Amend the entries in the table for Empty packagings and for Classes 1, 4.1, 4.2, 4.3, 5.1, 5.2 and 9 as follows:

			5 kg	20 kg	50 kg	100 kg	333 kg	500 kg	1000 kg	Unlimited
1, 2 [only the gases classified under (a) and (b)], 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 8 and 9	Empty packagings (including receptacles, excluding tanks)									X
1	1°, 3°, 5°-7°, 9°, 10°, 12°, 13°, 15°, 17°-19°, 21°-23°, 25°, 27°, 30°-32°, 34°				X					
	2°, 4°, 8°, 11°, 24°		X							
	26°, 29°, 33°			X						
	35°-37°, 39°-41°, 43°							X		
	47°									X
	48°		X							
4.1	1° (b) and 2° (c)									X
	6° (c) and 11° (c)						X			
	21° to 36°		X							
	Other substances				X					
4.2	1° (c)									X
	Substances classified under (b)						X			
	Substances classified under (c)								X	
4.3	11°(a), 13°(a), 14°(a) and 16°(a) to 18°(a)		X							
	11°(b) to 17°(b)						X			
	11°(c) to 15°(c)								X	
5.1	Substances classified under (a)				X					
	Substances classified under (b)					X				
	Substances classified under (c)							X		
	5°			X						
5.2	5°, 6°, 15°, 16°			x*/						
	7°-10°, 17°-20°				x*/					

*/ Excluding the mass of the refrigerating appliance, if any.

10 011 (cont'd) In the table, add the following entry for Class 7 radioactive material, with an "X" in the "Unlimited" column:

"7 Material of marginal 2704, Schedules 1 to 4".

In the "SUBSTANCES" column, amend the two entries for Class 9 as follows:

"Substances or articles classified under 1°(b), 4°(c) or 5°

Substances or articles classified under 1°(c), 6° or 7°"

The particulars for Class 4.1 in the table of examples of the various calculations are amended as follows:

In the "Substance" column, replace "7° (a)" by "4° (c)".

10 111 (2) Delete "and (5)".

10 118 Delete paragraph (5)

Insert note to read:

"NOTE: See marginal 10 500 for the marking and labelling of containers."

10 130 Delete this marginal and the heading above it.

10 220 Add at the end of paragraph (1):

"Vehicles with a tilting tank for the carriage of powdery or granular substances with rear discharge do not require a bumper if the rear fittings of the tank are provided with a means of protection which protects the tank in the same way as a bumper."

Insert the following heading and marginal:

"Braking

10 221 (1) Motor vehicles (tractors and rigid vehicles) with 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 1/, made up of the following transport units:

tank vehicles,

vehicles carrying demountable tanks or batteries of receptacles,

vehicles carrying tank-containers with a capacity of more than 3,000 litres, and

type III transport units, (see marginal 11 204(3)),

1/ For semi-trailers and centre-axle trailers, the maximum mass refers to the weight transmitted to the ground by the axle or axles of the semi-trailer or centre-axle trailer, when that trailer is coupled to the drawing vehicle and carrying its maximum load.

10 221 (cont'd) first registered after 30 June 1993, shall be fitted with an anti-lock braking device, the performance of which shall meet the provisions of Annex 13 to Regulation No. 13 (addendum 12 to the 1958 Agreement done in Geneva), including the 06 series of amendments. For motor vehicles, only anti-lock devices of category 1 of annex 13 shall be permitted. For trailers, paragraph 3.2 of annex 13 shall apply.

Electrical connections between tractor vehicles and trailers shall be made by means of connector ISO 7638.

(2) Each transport unit of the types of vehicles specified in paragraph (1) above shall be fitted with an endurance braking system to stabilize the speed on a long descent without using the service, emergency or parking brakes.

This may be a single device or a combination of several devices.

The transport unit shall be equipped with an anti-lock braking device acting at least on the service brakes of the axle controlled by the endurance braking system and on the endurance braking system itself.

The endurance braking system shall enable the transport unit, at its maximum mass, to satisfy the requirements of effectiveness set out in Regulation No. 13, Annex 5 (Addendum 12 to the 1958 Agreement signed at Geneva), including the 06 series of amendments.

The endurance braking system shall comprise several stages of effectiveness, including a low stage appropriate for running in the unladen condition.

All three endurance braking control options provided for in ECE Regulation No. 13 shall be permitted, but in case of anti-lock braking device failure, integrated or combined endurance brakes shall be automatically switched off.

Vehicles equipped with endurance braking systems placed behind the rear wall of the driver's cab shall be equipped, between the braking system and the tank or load, with a thermal shield, secured and located so as to avoid any heating, even local, of the tank shell or the load.

In addition, the thermal shield shall protect the braking system against any outflow or leakage, even accidental, of the load. For instance, a protection including a twin shell shield shall be considered satisfactory.

(3) Each transport unit of the types of vehicle specified in paragraph (1) above in service after 31 December 1999 shall be equipped with the devices referred to in paragraphs (1) and (2)."

10 240 Amend paragraph (1) to read as follows:

"(1) Every transport unit carrying dangerous goods shall be equipped with:

10240 (cont'd)

(a) at least one portable fire extinguisher of minimum capacity 2 kg dry powder (or equivalent rating for suitable extinguishants) suitable for fighting a fire in the engine or cab of the transport unit, and such that, if it is used to fight a fire involving the load, it does not aggravate the fire and, if possible, controls it; however, if the vehicle is equipped with a fixed fire extinguisher, automatic or easily brought into action for fighting a fire in the engine, the portable extinguisher need not be suitable for fighting a fire in the engine;

(b) in addition to the equipment prescribed under (a) above, at least one portable fire extinguisher of minimum capacity 6 kg dry powder (or equivalent rating for suitable extinguishants) suitable for fighting a tyre/brake fire or one involving the load, and such that, if it is used to fight a fire in the engine or cab of the transport unit, it does not aggravate the fire."

10 251 Replace the first two lines with the following text:

"The requirements concerning the electrical equipment set out in paragraph (a) of Appendix B2 shall apply to every transport unit carrying dangerous goods for which an approval according to marginals 10 282 and 10 283 is required. The requirements in paragraphs (b) and (c) of Appendix B.2 shall apply only to the following vehicles:"

(a)
- existing text unchanged

(b)

10 260 Add the following subparagraph to marginal 10 260 after (c):

"(d) the necessary equipment to take the first safety measures referred to in the safety instructions set out in marginal 10 385."

10 315 Replace with the following text:

"10 315 Special training of drivers

(1) Drivers of tank-vehicles, drivers of transport units carrying tanks or tank-containers with a total capacity of more than 3,000 litres and/or a permissible maximum weight exceeding 3.5 tonnes 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 the carriage of dangerous goods.

(2) As from 1 January 1995 drivers of vehicles other than those mentioned under paragraph (1) with a permissible maximum weight exceeding 3.5 tonnes, of the categories C and E referred to in annex 6 to the Convention on Road Traffic (1968), shall hold a certificate as described under paragraph (1).

10 315 (cont'd)

(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 a test approved by that authority. However, the competent authority to which an application has been made for an extension of the period of validity of the certificate may exempt the applicant from undertaking a refresher course provided that he can prove he has continued in his occupation without a break since his certificate was issued or last revalidated. Seasonal lay-offs, holidays and breaks between employment of up to six months in any 12-month period shall be allowed.

(4) 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 environment and for limiting the effects of the incident. This training, which shall include individual practical exercices, shall as a basic training for all categories of driver cover:

(a) the general requirements governing the carriage of dangerous goods;

(b) the main types of hazard;

(c) information on environmental protection in 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 operations.

For drivers of vehicles carrying goods in packages, the knowledge required in order to qualify for a training certificate shall also cover:

10 315 (cont'd)

(m) handling and stowage of packages.

For drivers of vehicles carrying goods in tanks, the knowledge required in order to qualify for a training certificate shall also cover:

(n) the behaviour of vehicles carrying tanks or tank-containers on the road, including movements of the load.

(5) 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 Contracting Party or by any organization recognized by that authority shall be accepted during their period of validity by the competent authorities of other Contracting Parties.

(6) Certificates drawn up in accordance with the model prescribed in the provisions of ADR in force as at 31 December 1989 may be used until their date of expiry. However for the carriage of goods of Class 1 they may only be used if they are valid for Classes 1a, 1b and 1c, and for the carriage of goods of Class 9 they may only be used if they are valid for Classes 3, 6.1 and 8.

(7) Certificates drawn up in accordance with the model prescribed in the provisions of ADR in force as at 28 January 1992 may be used for the carriage of dangerous goods in tanks or of goods of Class 1 respectively until their date of expiry."

10 381 In paragraph (1) (a), amend "2002(3) and (4)" to read "2002(3), (4) and (9)".

10 385 Amend (e) of paragraph (1) to read:

"(e) in the case of tank-vehicles or transport units comprising tanks or tank-containers with a total capacity of more than 3000 litres and/or a permissible maximum weight exceeding 3.5 tonnes carrying substances covered by Appendix B.5, the name of the substance(s), the Class, item number(s) and letter(s), and the substance identification and hazard identificatiion numbers in accordance with Appendix B.5."

10 414 Amend paragraph (4) to read:

"(4) Packages bearing labels conforming to model No. 12 shall be protected against damage that might be caused by other packages."

Amend heading of section 5 and text of marginal 10 500 to read:

"Section 5: Special provisions concerning the operation of (tank-) vehicles, batteries of receptacles and (tank-) containers"

10 500 Marking

(1) Add the following text before the Note:

"If the size and construction of the vehicle are such that the available surface area is insufficient to affix these orange-coloured plates, their dimensions may be reduced to 300 mm for the base, 120 mm for the height and 10 mm for the black border."

10 500 (cont'd) Amend paragraph (2) to read:

"(2) Tank-vehicles or transport units comprising tanks or tank-containers with a total capacity of more than 3,000 litres and/or a permissible maximum weight exceeding 3.5 tonnes, carrying substances covered by Appendix B.5, shall in addition display on the sides of each tank or tank compartment, clearly visible and parallel to the longitudinal axis of the vehicle, orange-coloured plates identical with those prescribed in paragraph (1). These orange-coloured plates shall bear the identification numbers prescribed in Appendix B.5 for each of the substances carried in the tank or in a compartment of the tank."

Delete the remainder of the marginal after paragraph (5) and insert the following:

"(6) The above requirements are also applicable to empty fixed or demountable tanks, tank-containers and batteries of receptables, uncleaned and not degassed.

(7) Orange-coloured plates which do not relate to dangerous goods carried, or residues thereof, shall be removed or covered.

Labelling

(8) If the dangerous substances carried in a container are such that, under Annex A, one or more danger labels have to be affixed to the packages containing them, the same label or labels shall be affixed to the outside of the container containing those substances in packages or in bulk. However, labels Nos. 10, 11 and 12 need not be affixed.

(9) Tank-containers and batteries of receptacles shall bear on both sides the labels prescribed in the XX 500 marginals of each class. If these labels are not visible from outside the carrying vehicles, the same labels shall also be affixed on both sides and at the rear of the vehicle.

(10) Vehicles with fixed or demountable tanks shall bear on both sides and at the rear the labels prescribed in marginal XX 500 of each Class.

(11) The requirements of marginal 10 500 (9) and (10) are also applicable to empty fixed or demountable tanks, tank-containers and batteries or receptacles, uncleaned and not degassed.

(12) Labels which do not relate to dangerous goods being carried, or residues thereof, shall be removed or covered."

PART II

11 108 Present text becomes paragraph (2). Add new paragraph (1) as follows:

"(1) Substances and articles of Compatibility Group L shall only be carried as a full load."

11 315 Present text is replaced by the following:
"Special training of drivers

11 315 The provisions of paragraphs (1), (3), (4)(a) to (m) and (5) of marginal 10 315 shall apply to drivers of vehicles carrying substances or articles of Class 1 in excess of the limited quantities specified in marginal 10 011."

11 401 In the table, the column headings are amended to read as follows:

Division	1.1	1.2	1.3	1.4	1.5	-
Item	1°-12°	13°-25°	26°-34°	35°-45°	46°,47°	48°,49°	51°

11 402 In the second sentence, amend " 40°" to "48°".

11 403 In the table, insert new column L and row L.
Where these converge, insert "1/".
Add the following footnote:

"1/ Packages containing substances and articles of Compatibility Group L may be loaded together on one vehicle with packages containing the same type of substances and articles of that compatibility group."

Amend paragraph (2) to read as follows:

"(2) Packages bearing a label conforming to models Nos. 1, 1.4 or 1.5 shall not be loaded together in one vehicle with packages bearing a label conforming to models Nos. 2, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 6.1A, 7A, 7B, 7C, 8 or 9."

11 500 New marginal and amended heading of section 5 to read as follows:

"Section 5: Special provisions concerning the operation of vehicles and containers

Marking and labelling

Labelling

(1) Transport units carrying packages or articles bearing labels conforming to models Nos. 1, 1.4 or 1.5 shall bear a similar label on both sides and at the rear. Compatibility groups shall not be indicated on labels if the transport unit is carrying substances and articles belonging to several compatibility groups.

(2) A transport unit carrying substances or articles of different divisions shall bear only labels conforming to the model of the most dangerous division, in the order 1.1 (most dangerous), 1.5, 1.2, 1.3, 1.4 (least dangerous). When substances of 48° are carried with substances or articles of division 1.2, the transport unit shall be labelled as division 1.1.

(3) Transport units carrying substances or articles of the following items and identification numbers shall in addition bear labels conforming to model No. 6.1:

4° Nos. 0076 and 0143
21° No. 0018
26° No. 0077
30° No. 0019
43° No. 0301

11 500 (cont'd) (4) Transport units carrying articles of the following items and identification numbers shall in addition bear labels conforming to model No. 8:

21° Nos. 0015 and 0018
30° Nos. 0016 and 0019
43° No. 0301

(5) The provisions of paragraphs (1) to (4) shall not apply to transport units carrying containers providing the containers are labelled in accordance with the requirements of marginal 10 500 (8)."

21 105 Delete this marginal and its heading.

21 130 Delete this marginal and its heading.

21 403 Amend to read:

"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, 1.5 or 01."

21 500 Headings and marginal deleted and replaced by the following text:

"Section 5: Special provisions concerning the operation of (tank-) vehicles, batteries of receptacles and (tank-) containers

Marking and labelling

Labelling

21 500 (1) Vehicles with fixed or demountable tanks, tank-containers and batteries of receptacles containing or having contained (empty, uncleaned) substances of Class 2 other than those listed in table 2 of this marginal shall bear the label(s) indicated in table 1 below:

Table 1

Substances and articles	Label model Nos.
Classified under (a)	2
Classified under (at)	6.1
Classified under (b)	3
Classified under (bt)	6.1 + 3
Classified under (c)	3
Classified under (ct)	6.1 + 3

(2) Vehicles with fixed or demountable tanks, tank-containers, or batteries of receptacles, containing or having contained (empty, uncleaned) substances listed in table 2 below shall bear the label(s) indicated.

21 500 (cont'd) Table 2

Item no.	Substances	Label model Nos.
1°(a)	Oxygen	2 + 05
2°(a)	Mixtures with more than 25 % oxygen by volume	2 + 05
3°(at)	Chlorine, hydrogen bromide, phosgene	6.1 + 8
3°(at)	Nitrogen dioxide	6.1 + 05
5°(a)	Nitrous oxide	2 + 05
5°(at)	Hydrogen chloride	6.1 + 8
7°(a)	Nitrous oxide, oxygen	2 + 05
8°(a)	Mixtures with more than 32 % nitrous oxide by mass, air, mixtures containing more than 20 % oxygen by mass	2 + 05

31 130 Delete this marginal and its heading.

31 403 Paragraphs (1) and (2) are deleted and replaced by the following text:

"Packages bearing a label conforming to model No. 3 shall not be loaded together on the same vehicle with packages bearing a label conforming to models Nos. 1, 1.4, 1.5 or 01."

Replace the headings before marginal 31 500 with the following:

"Section 5: Special provisions concerning the operation of (tank-) vehicles and (tank-) containers

Marking and labelling

Labelling"

31 500 Amend the first paragraph to read:

"Vehicles with fixed or demountable tanks and tank-containers containing or having contained substances of 1° to 6°, 11° to 26°, 31° or 33° , shall bear labels conforming to model No. 3."

31 500 (cont'd) Marginals 41 000 to 60 999 are replaced by the following text:

Class 4.1 : Flammable solids

General

(only the general provisions of Part I apply)

41 000-41 099

Section 1 : Mode of carriage

41 100-41 104

Method of dispatch and restrictions on forwarding

41 105 (1) Substances of 5° and 15° may be carried only in tank-vehicles, demountable tanks and tank-containers.

(2) Substances of 34° and 35° shall be so dispatched that the following ambient temperatures are not exceeded.

	maximum temperature
2,2'-azodi-(2,4-dimethylvaleronitrile)	+ 10°C
2,2'-azodi-(2,4-dimethyl-4-methoxy-valeronitrile)	- 5°C
azodiisobutyronitrile	+ 40°C
2,2'-azodi-(2-methylbutyronitrile)	+ 40°C
3-(2-hydroxyethoxy)-4-pyrrolidin-1-yl benzenediazonium zinc chloride	+ 40°C
2,5-diethoxy-4-morpholinobenzene-diazonium zinc chloride	+ 35°C
4-[benzyl-(ethyl)-amino]-3-ethoxy-benzenediazonium zinc chloride	+ 40 C
4-[benzyl-(methyl)-amino]-3-ethoxy-benzenediazonium zinc chloride	+ 40°C
4-dimethylamino-6-(2-dimethylaminoethoxy)-toluene-2-diazonium zinc chloride	+ 40°C

If a quantity of refrigerant is placed in the protective packaging, it shall be so proportioned that the specified temperatures are not exceeded during the whole transport operation, including loading and unloading. The use of liquid air or liquid oxygen as a refrigerant is prohibited.

(3) Substances of 26°, 36° and 37° shall be shielded from direct sunlight and heat during carriage.

41 106-41 110

Carriage in bulk

41 111 (1) Substances listed by name under 6° (c) with the exception of naphthalene, 11° (c), 12° (c), 13° (c) and 14° (c) and solid wastes classified under (c) of the above-mentioned items may be carried in bulk in closed or sheeted vehicles.

Naphthalene of 6° (c) may be carried in bulk in closed vehicleswith a metal body or in vehicles covered with a non-combustible sheet and having a metal body or having floor and walls protected from the load.

(2) Waste of 4° (c) may be carried in bulk in open but sheeted vehicles with adequate ventilation. Suitable measures shall be taken to ensure that none of the contents, particularly liquid components, can escape.

41 112-
41 117

Carriage in containers

41 118 Small containers used for the carriage in bulk of substances mentioned in marginal 41 111 shall meet the requirements for vehicles in that marginal.

41 119-
41 199

Section 2: Special requirements to be fulfilled by the means of transport and its equipment

41 200-
41 203

Types of vehicle

41 204 Insulated, refrigerated and mechanically-refrigerated vehicles used in accordance with the provisions of 41 105 (2) shall conform to the following conditions:

(a) the vehicle shall be such and so equipped as regards its insulation and means of refrigeration that the maximum temperature prescribed in 41 105 (2) is not exceeded. The overall heat transfer coefficient shall be not more than 0.4 W/m^2 K;

(b) the vehicle shall be so equipped that vapours from the substances or the coolant carried cannot penetrate into the driver's cab;

(c) a suitable device shall be provided enabling the temperature prevailing in the loading space to be determined at any time from the cab;

(d) the loading space shall be provided with vents or ventilating valves if there is any risk of a dangerous excess pressure arising therein. Care shall be taken where necessary to ensure that refrigeration is not impaired by the vents or ventilating valves;

41 204 (cont'd)

(e) the refrigerant shall not be flammable; and

(f) the refrigerating appliance of a mechanically refrigerated vehicle shall be capable of operating independently of the engine used to propel the vehicle.

41 205-
41 299

Section 3: General service provisions

41 300-
41 320

Supervision of vehicles

41 321 The provisions of marginal 10 321 shall apply to the dangerous goods listed below when their quantity exceeds the mass indicated:

substances of 21° to 25° and 31° to 33°: 1,000 kg
substances of 26°, 34° and 35°: 100 kg

In addition, vehicles carrying substances of 34° shall be continuously supervised in order to prevent any malicious act and to alert the driver and the competent authorities in the event of loss or fire.

41 322-
41 399

Section 4: Special provisions concerning loading, unloading and handling

41 400

Limitation of the quantity carried

41 401 Not more than 5,000 kg of the substances of 34°, and not more than 500 kg of the substances of 37° shall be carried in a single transport unit.

41 402

Prohibition of mixed loading on one vehicle

41 403 Packages bearing a label conforming to model No. 4.1 shall not be loaded together on one vehicle with packages bearing a label conforming to model Nos. 1, 1.4, 1.5 or 01.

41 404-
41 409

Precautions with respect to foodstuffs, articles of consumption and animal feedstuffs.

41 410 (1) Packages bearing labels conforming to model No. 6.1 shall be kept separate from foodstuffs, articles of consumption and animal feedstuffs in vehicles and at places of loading, unloading and transloading.

41 410 (cont'd) (2) Empty uncleaned packagings bearing labels conforming to model No. 6.1 shall be kept separate from foodstuffs, articles of consumption and animal feedstuffs in vehicles and at places of loading, unloading and transloading.

41 411-
41 413

Handling and stowage

41 414 (1) Packages containing substances of 26°, 34° and 35° shall be so stowed that they are easily accessible.

(2) Packages containing substances of 34° shall be loaded and unloaded without intermediate storage; when trans-shipped, the substances shall only be loaded directly from one vehicle into another. The prescribed maximum temperatures shall not be exceeded during this procedure (see marginal 41 105 (2)).

(3) Packages containing the substance of 26° shall be stored only in cool, well-ventilated places away from heat sources.

41 415-
41 499

Section 5: Special provisions concerning the operation of (tank-) vehicles and (tank-) containers

Marking and labelling

Labelling

41 500 Vehicles with fixed or demountable tanks and tank-containers containing or having contained (empty, uncleaned) substances of this class shall bear labels conforming to model No. 4.1."

Those containing or having contained substances of 7° or 16° shall in addition bear labels conforming to model No. 6.1

Those containing or having contained substances of 8° or 17° shall in addition bear labels conforming to model No. 8.

41 501-
41 508

Halts of limited duration for service requirements

41 509 During the carriage of substances of 34°, stops for service requirements shall as far as possible not be made near inhabited places or frequented places. A longer stop near such places is permissible only with the consent of the competent authorities.

41 510-
41 599

Section 6: Transitional provisions, derogations and provisions peculiar to certain countries

(Only the general provisions of Part I apply.)

41 600-
41 999

Class 4.2. Substances liable to spontaneous combustion

General

(Only the general provisions of Part I apply.)

42 000-
42 099

Section 1: Mode of carriage

42 100 -
42 110

Carriage in bulk

42 111 Substances of 1° (c), 2° (c), 3°, borings, shavings, turnings and cuttings of ferrous metals of 12° (c), spent iron oxide and spent iron sponge of 16° (c) and solid waste classified under (c) of the above-mentioned items, may be carried in bulk.

These substances shall, however, be carried in closed or sheeted vehicles with a metal body.

42 112 -
42 117

Carriage in containers

42 118 Small containers used for the carriage in bulk of substances mentioned in marginal 42 111 shall meet the requirements for vehicles in that marginal.

42 119 -
42 199

Section 2: Special requirements to be fulfilled by the means of transport and its equipment

42 200-
42 203

Types of vehicle

42 204 Packages containing substances of Class 4.2 shall be carried in closed or sheeted vehicles.

42 205-
42 299

Section 3: General service provisions

42 300-
42 320

Supervision of vehicles

42 321 The provisions of marginal 10 321 shall apply to the dangerous goods listed below when their quantity exceeds the mass indicated:

Substances classified under (a) of the various items and substances of 22°: 10,000 kg.

42 322-
42 377

Empty tanks

42 378 For tanks which have contained phosphorus of 11° (a) and 22°, see also marginals 211 470(2) and 212 470(2).

42 379-
42 399

Section 4: Special provisions concerning loading, unloading and handling

42 400-
42 402

Prohibition of mixed loading on one vehicle

42 403 Packages bearing a label conforming to model No. 4.2 shall not be loaded together on one vehicle with packages bearing a label conforming to models Nos. 1, 1.4, 1.5 or 01.

42 404-
42 409

Precautions with respect to foodstuffs, articles of consumption and animal feedstuffs

42 410 (1) Packages bearing labels conforming to model No. 6.1 shall be kept separate from foodstuffs, articles of consumption and animal feedstuffs in vehicles and at places of loading, unloading and transloading.

(2) Uncleaned empty packagings bearing a label conforming to model No. 6.1 shall be kept separate from foodstuffs, articles of consumption and animal feedstuffs in vehicles and at places of loading, unloading and transloading.

42 411-
42 413

Handling and stowage

42 414 Straw or other readily combustible materials shall not be used for the stowage of packages in vehicles.

42 415-
42 499

Section 5: Special provisions concerning the operation of (tank-) vehicles and (tank-) containers

Marking and labelling

Labelling

42 500- Vehicles with fixed or demountable tanks and tank-containers containing or having contained (empty, uncleaned) substances of this class shall bear labels conforming to model No. 4.2.

Those containing or having contained maneb or solid preparations of maneb of 16°c), substances of 17°a) and 31° to 33° shall in addition bear labels conforming to model No. 4.3.

Those containing or having contained substances of 7°b) or c), 8°, 11°, 18°b) or c), 19° and 22° shall in addition bear labels conforming to model No. 6.1.

Those containing or having contained substances of 9°, 10°, 15°, 20° and 21° shall in addition bear labels conforming to model No. 8.

42 501-
42 599

Section 6: Transitional provisions, derogations and provisions peculiar to certain countries

(Only the general provisions of Part I apply.)

42 600-
42 999

Class 4.3: Substances which in contact with water emit flammable gases

General

(Only the general provisions of Part I apply.)

43 000-
43 099

Section 1: Mode of carriage

43 100-
43 110

Carriage in bulk

43 111 (1) Substances of 11° (c), 12° (c), 13° (c), 14° (c), 15° (c), 17° (b) and 20° (c) may be carried in bulk in specially equipped vehicles. The openings used for loading and unloading shall be capable of being closed hermetically.

(2) Aluminium dross of 13°(b) may be carried in bulk in well-ventilated sheeted vehicles.

(3) Aluminium dross of 13° (c), calcium silicide in pieces of 12°(b) and substances of 12°(c) in pieces may also be carried in bulk in sheeted or closed vehicles.

43 112-
43 117

Carriage in containers

43 118 Small containers used for the carriage in bulk of substances mentioned in marginal 43 111 shall meet the requirements for vehicles in that marginal.

43 119-
43 199

Section 2: Special requirements to be fulfilled by the means of transport and its equipment

43 200-
43 203

Types of vehicle

43 204 Packages containing substances of Class 4.3 shall be loaded in closed or sheeted vehicles.

43 205-
43 299

Section 3: General service provisions

43 300-
43 320

Supervision of vehicles

43 321 The provisions of marginal 10 321 shall apply to the dangerous goods listed below when their quantity exceeds the mass indicated:

Substances classified under (a) of the various items: 10,000 kg.

43 322-
43 399

Section 4: Special provisions concerning loading, unloading and handling

43 400–
43 402

Prohibition of mixed loading on one vehicle

43 403 Packages bearing a label conforming to model No. 4.3 shall not be loaded together on one vehicle with packages bearing a label conforming to models Nos. 1, 1.4, 1.5 or 01.

43 404–
43 409

Precautions with respect to foodstuffs, articles of consumption and animal feedstuffs

43 410 (1) Packages bearing labels conforming to model No. 6.1 shall be kept separate from foodstuffs, articles of consumption and animal feedstuffs in vehicles and at places of loading, unloading and transloading.

(2) Empty packagings, uncleaned, bearing labels conforming to model No. 6.1 shall be kept separate from foodstuffs, articles of consumption and animal feedstuffs in vehicles and at places of loading, unloading, and transloading.

43 411–
43 413

Handling and stowage

43 414 Packages shall be so loaded in the vehicle that they cannot shift dangerously, tip over or fall off. They shall be protected against any friction or impact. While packages are being handled, special measures shall be taken to prevent them from coming into contact with water.

43 415–
43 499

Section 5: Special provisions concerning the operation of (tank-) vehicles and (tank-) containers

Marking and labelling

Labelling

43 500 Vehicles with fixed or demountable tanks and tank-containers containing or having contained (empty, uncleaned) substances of this class shall bear labels conforming to model No. 4.3.

Those containing or having contained substances of 1° or 2° shall in addition bear labels conforming to model Nos. 3 and 8.

Those containing or having contained substances of 3° shall in addition bear labels conforming to model No. 3.

43 500 (cont'd) Those containing or having contained substances of 14°b) or c) shall in addition bear labels conforming to model No. 4.2

Those containing or having contained substances of 15°, 22°b) or c) or 23° shall in addition bear labels conforming to model No. 6.1.

Those containing or having contained substances of 24°b) or c) or 25° shall in addition bear labels conforming to model No. 8.

43 501-
43 599

Section 6: Transitional provisions, derogations, and provisions peculiar to certain countries

(Only the general provisions of Part I apply)

43 600-
50 999

Class 5.1: Oxidizing substances

General

(Only the general provisions of Part I apply)

51 000-
51 099

Section 1: Mode of carriage

51 100-
51 110

Carriage in bulk

51 111 (1) Substances of 11° to 13°, 16°, 18°, 19°, 21°, 22° (c) and solid wastes, classified under the above-mentioned items may be carried in bulk as a full load in closed or sheeted vehicles. The sheet shall be of an impermeable and non-combustible material. Steps shall be taken to ensure that, if a leakage occurs, the substances contained in the vehicle cannot come into contact with wood or any other combustible material.

(2) Substances of 11° to 13°, 16°, 18°, 19°, 21°, 22° (c) and solid wastes classified under the above-mentioned items shall be carried in closed vehicles or sheeted vehicles covered with an impermeable non-combustible sheet. Vehicles shall be so constructed either that the substance cannot come into contact with wood or any other combustible material or that the entire surface of the floor and walls, if combustible, has been provided with an impermeable and incombustible surfacing or treated with substances rendering the wood difficult to ignite.

51 112-
51 117

Carriage in containers

51 118 (1) With the exception of fragile packages within the meaning of marginal 10 014(1) and packages containing hydrogen peroxide or solutions of hydrogen peroxide of 1° (a) or tetranitromethane of 2°, packages containing substances listed in this class may be carried in small containers.

(2) Containers intended for the carriage in bulk of substances of 11° to 13°, 16°, 18° and 19° shall be made of metal, be leakproof, be covered with a lid or an impermeable sheet resistant to combustion, and be so constructed that the substances in the containers cannot come into contact with wood or any other combustible material.

(3) Containers intended for the carriage in bulk of substances of 21° and 22° (c) shall be covered with a lid or an impermeable sheet resistant to combustion and be so constructed either that the substance in the containers cannot come into contact with wood or any other combustible material or that the entire surface of the floor and walls, if made of wood, has been provided with an impermeable surfacing resistant to combustion or has been coated with sodium silicate or a similar substance.

51 119-
51 199

Section 2: Special requirements to be fulfilled by the means of transport and its equipment

51 200-
51 203

Types of vehicle

51 204 Flexible IBCs containing substances of 11° to 13° and 16° (b) shall be carried in closed or sheeted vehicles. The sheet shall be of an impermeable and non-combustible material. Steps shall be taken to ensure that, if a leakage occurs, the substances contained in the vehicle cannot come into contact with wood or any other combustible material.

51 205-
51 219

Vehicles used for the carriage of dangerous goods in fixed or demountable tanks, or tank-containers of a capacity greater than 3.0 litres

51 220 The following provisions shall apply to the carriage of liquids of 1° (a).

(1) Unless the driver's cab is made of fire-resistant materials, a shield made of metal or other suitable material the same width as the tank shall be fitted at the back of the cab. Any windows in the back of the cab or in the shield shall be hermetically closed and made of fire-resistant safety glass with fire-resistant frames. There shall be a clear space of not less than 15 cm between the tank and the cab or the shield.

51 220 (cont'd) (2) No wood, unless covered with metal or with a suitable synthetic material, shall be used in the construction of any part of the vehicle situated to the rear of the shield prescribed in paragraph (1) above.

(3) The engine and (except where the vehicle is driven by a diesel engine) the fuel tank shall be placed forward of the rear wall of the driver's cab or of the shield, or if placed otherwise shall be specially protected.

(4) Vehicles shall carry a tank placed as securely as possible, and having a capacity of about 30 litres of water. An anti-freeze 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.

51 221-
51 299

Section 3: General service provisions

51 300-
51 320

Supervision of vehicles

51 321 The provisions of marginal 10 321 shall apply to the dangerous goods listed below when their quantity exceeds the mass indicated:

substances of 5° and substances classified under (a) of all other items: 10,000 kg.

51 322-
51 399

Section 4: Special provisions concerning loading, unloading and handling

51 400-
51 402

Prohibition of mixed loading on one vehicle

51 403 Packages bearing a label conforming to model No. 5.1 shall not be loaded together on one vehicle with packages bearing a label conforming to models Nos. 1, 1.4, 1.5 or 01.

51 404-
51 409

Precautions with respect to foodstuffs, articles of consumption and animal feedstuffs

51 410 (1) Packages bearing labels conforming to model No. 6.1 shall be kept apart from foodstuffs, other articles of consumption and animal feedstuffs, in vehicles and at places of loading, unloading and transloading.

(2) Empty uncleaned packagings bearing labels conforming to model No. 6.1 shall be kept apart from foodstuffs, other articles of consumption and animal feedstuffs, in vehicles and at places of loading, unloading and transloading.

51 411-
51 413

Handling and stowage

51 414 The use of straw or any other combustible substance for stowing packages in vehicles is prohibited.

51 415-
51 499

Section 5: Special provisions concerning the operation of (tank-) vehicles and (tank-) containers

Marking and labelling

Labelling

51 500 Vehicles with fixed or demountable tanks and tank-containers containing or having contained (empty, uncleaned) substances of this class shall bear labels conforming to model No. 5.1.

Those containing or having contained substances of 5° shall in addition bear labels conforming to model Nos. 6.1 and 8.

Those containing or having contained substances of 2° or 29°b) or c) shall in addition bear labels conforming to model No. 6.1.

Those containing or having contained substances of 1°a) or b), 3° or 31°b) or c) shall in addition bear labels conforming to model No. 8.

51 501-
51 599

Section 6: Transitional provisions, derogations, and provisions peculiar to certain countries

(Only the general provisions of Part I apply).

51 600-
51 999

Class 5.2: Organic peroxides

General

(Only the general provisions of Part I apply.)

52 000-
52 099

Section 1: Mode of carriage

52 100-
52 104

Method of dispatch and restrictions on forwarding

52 105 (1) Substances of 11° to 20° shall be forwarded in such manner that the control temperatures indicated in marginal 2550 (16) to (19), given for substances listed in marginal 2551 and for non-listed substances in the approved conditions of carriage (see marginal 2550(8)), are never exceeded.

(2) Maintenance of the prescribed temperature is essential for the safe carriage of many organic peroxides. In general, there shall be:

- thorough inspection of the transport unit prior to loading;
- instructions to the carrier about the operation of the refrigeration system including a list of the suppliers of coolant available en route;
- procedures to be followed in the event of loss of control;
- regular monitoring of operating temperatures; and
- provision of a back-up refrigeration system or spare parts.

(3) Any control and temperature sensing devices in the refrigeration system shall be readily accessible and all electrical connections shall be weather-proof. The temperature of the air inside the transport unit shall be measured by two independent sensors and the output shall be recorded so that any change in temperature is readily detectable. The temperature shall be checked every four to six hours and logged. When substances having a control temperature of less than +25°C are carried, the transport unit shall be equipped with visible and audible alarms, powered independently of the refrigeration system and set to operate at or below the control temperature.

(4) If the control temperature is exceeded during carriage, an alert procedure shall be initiated involving any necessary repairs to the refrigeration equipment or an increase in the cooling capacity (e.g. by adding liquid or solid coolant). There shall also be frequent checking of the temperature and preparations for implementation of the emergency procedures. If the emergency temperature (see also marginals 2550(17) and 2551) is reached, the emergency procedures shall be set in operation.

52 105 (cont'd)

(5) The means of temperature control chosen for the transport operation depends on a number of factors. Amongst those to be considered are:

- the control temperature(s) of the substance(s) to be carried;
- the difference between the control temperature and the expected ambient temperature;
- the effectiveness of the thermal insulation;
- the duration of the transport operation; and
- the safety margin to be allowed for delays en route.

(6) Suitable methods to prevent the control temperature from being exceeded are listed below, in ascending order of effectiveness:

(a) thermal insulation; provided that the initial temperature of the organic peroxide(s) is sufficiently below the control temperature;

(b) thermal insulation and coolant system; provided that:

- an adequate quantity of non-flammable coolant (e.g. liquid nitrogen or solid carbon dioxide), allowing a reasonable margin for possible delay, is carried or a menas of replenishment is assured;
- liquid oxygen or air is not used as coolant;
- there is a uniform cooling effect even when most of the coolant has been consumed; and
- the need to ventilate the transport unit before entering is clearly indicated by a warning on the door(s);

(c) thermal insulation and single mechanical refrigeration; provided that flameproof electrical fittings are used within the coolant compartment to prevent ignition of flammable vapours from the organic peroxides;

(d) thermal insulation and combined mechanical refrigeration system and coolant system; provided that:

- the two systems are independent of one another; and
- the requirements in (b) and (c) are met;

(e) thermal insulation and dual mechanical refrigeration system; provided that:

- apart from the integral power supply unit, the two systems are independent of one another;
- each system alone is capable of maintaining adequate temperature control; and

52 105 (cont'd)

- flameproof electrical fittings are used within the coolant compartment to prevent ignition of flammable vapours from the organic peroxides.

(7) For substances of 11° and 12°, one of the following methods of temperature control described in paragraph (6) shall be used:

- method (c) when the maximum ambient temperature to be expected during carriage does not exceed the control temperature by more than 10°C; otherwise
- (d) or (e).

For substances of 13° to 20°, one of the following methods shall be used:

- method (a) when the maximum ambient temperature to be expected during carriage is at least 10°C below the control temperature;
- method (b) when the maximum ambient temperature to be expected during carriage does not exceed the control temperature by more than 30°C; otherwise
- method (c), (d) or (e).

52 106-
52 117

Carriage in containers

52 118 Fragile packages within the meaning of marginal 10 014(1), as well as packages containing substances of 1° or 2°, shall not be carried in small containers.

52 119-
52 199

Section 2: Special requirements to be fulfilled by the means of transport and its equipment

52 200-
52 203

Types of vehicle

52 204 Substances of 1° to 10° shall be loaded in closed or sheeted vehicles. Where, under the provisions of 52 105, substances are required to be carried in insulated, refrigerated or mechanically-refrigerated vehicles, those vehicles shall satisfy the provisions of 52 248. Substances of 11° to 20° contained in protective packagings filled with a coolant shall be loaded in closed or sheeted vehicles. If the vehicles used are closed they shall be adequately ventilated. Sheeted vehicles shall be fitted with side boards and a tail-board. The sheets of these vehicles shall be of an impermeable and non-combustible material.

52 205–
52 247

Insulated, refrigerated and mechanically-refrigerated vehicles

52 248 Insulated, refrigerated and mechanically-refrigerated vehicles used in accordance with the provisions of 52 105 shall conform to the following conditions:

(a) the vehicle shall be such and so equipped as regards its insulation and means of refrigeration (see marginal 52 105) that the maximum temperature prescribed in 52 105 is not exceeded. The overall heat transfer coefficient shall be not more than 0.4 W/m^2 K;

(b) the vehicle shall be so equipped that vapours from the substances or the coolant carried cannot penetrate into the driver's cab;

(c) a suitable device shall be provided enabling the temperature prevailing in the loading space to be determined at any time from the cab;

(d) the loading space shall be provided with vents or ventilating valves if there is any risk of a dangerous excess pressure arising therein. Care shall be taken where necessary to ensure that refrigeration is not impaired by the vents or ventilating valves;

(e) the refrigerant shall not be flammable; and

(f) the refrigerating appliance of a mechanically refrigerated vehicle shall be capable of operating independently of the engine used to propel the vehicle.

52 249–
52 299

Section 3: General service provisions

52 300–
52 320

Supervision of vehicles

52 321 The provisions of 10 321 shall apply to the dangerous goods listed below when their quantity exceeds the mass indicated:

- substances of 1°, 2°, 13° and 14°: 1,000 kg
- substances of 3°, 4°, 15° and 16°: 2,000 kg
- substances of 5°, 6°, 17° and 18°: 5,000 kg
- substances of 11° and 12°: 500 kg

52 401 (cont'd) In addition, vehicles carrying more than 500 kg of substances of 11° and 12° shall be subject at all times to supervision to prevent any malicious act and to alert the driver and competent authorities in the event of loss or fire.

52 322-
52 399

Section 4: Special provisions concerning loading, unloading and handling

52 400

Limitation of the quantities carried

52 401 (1) A transport unit shall not carry more than:

- 5,000 kg of substances of 1° and 2° if its loading space is ventilated at the top and the transport unit is insulated with heat-resistant material (see marginal 11 204(3)(a)), or 1,000 kg of substances of 1° and 2° if the transport unit does not meet these requirements;

- 10,000 kg of substances of 3° and 4°;

- 20,000 kg of substances of 5°, 6°, 7°, 8°, 9° and 10°;

- 1,000 kg of substances of 11° and 12°, or 5,000 kg if insulated with heat-resistant material;

- 5,000 kg of substances of 13° and 14°, or 10,000 kg if insulated with heat-resistant material; and

- 20,000 kg of substances of 15°, 16°, 17°, 18°, 19° and 20°.

(2) When substances of this class are loaded together in one transport unit, the limits given in paragraph (1) shall not be exceeded and the total contents shall not exceed 20,000 kg.

52 402 The provisions of marginals 10 500 and 52 204 shall not apply to the carriage of substances listed in or covered by 1° to 4° and 11° to 14° provided that the substance is packaged in accordance with packing method OP1A, OP1B, OP2A or OP2B, as required, and the quantity per transport unit is limited to 10 kg.

Prohibition of mixed loading on one vehicle

52 403 (1) Packages bearing a label conforming to model No. 5.2 shall not be loaded together in the same vehicle with packages bearing a label conforming to models Nos. 1, 1.4 or 1.5.

(2) Packages bearing labels conforming to models Nos. 5.2 and 01 shall not be loaded together in the same vehicle with packages bearing a label conforming to models Nos. 1, 1.4, 1.5, 2, 3, 4.1, 4.2, 4.3, 5.1, 6.1, 6.1A, 7A, 7B, 7C, 8 or 9.

52 404–
52 412

Cleaning before loading

52 413 Vehicles intended for the carriage of packages containing substances of Class 5.2 shall be carefully cleaned.

Handling and stowage

52 414 (1) Packages shall be loaded so that they can be unloaded at the point of destination without it being necessary to rearrange the load.

(2) Packages shall be kept upright and so secured and fixed that they cannot overturn or fall. They shall be protected against damage which might be caused by other packages.

(3) The use of readily flammable materials for stowing packages in vehicles is prohibited.

(4) Packages containing substances of 11° to 20° shall be so stowed as to be readily accessible.

(5) Packages containing substances of 11° to 20° shall be loaded and unloaded without intermediate storage, and shall in the event of transloading be transferred directly from one vehicle to another. The prescribed maximum temperatures shall not be exceeded for more than a short period during such handling (see 52 105(1)).

(6) Packages shall be loaded so that a free circulation of air within the loading space provides a uniform temperature of the load. If the contents of a vehicle or large container exceed 5,000 kg of organic peroxide, the load shall be divided into stacks of not more than 5,000 kg separated by air spaces of at least 0.05 m.

52 415–
52 499

Section 5: Special provisions concerning the operation of (tank-) vehicles and (tank-) containers

Marking and labelling

Labelling

52 500 Vehicles with fixed or demountable tanks and tank-containers containing or having contained (empty, uncleaned) substances of this class shall bear labels conforming to model No. 5.2.

Those containing or having contained substances which are highly corrosive or corrosive according to the criteria of class 8 (see marginal 2800(1)) shall in addition bear labels conforming to model No. 8. This is indicated in marginal 2551 (additional labelling) or when required in the approved conditions of carriage (see marginal 2550(8)).

52 501-
52 508

Halts of limited duration for service requirements

52 509 During the carriage of substances of 1°, 2°, 11° and 12° halts for service requirements shall so far as possible not be made in residential or urban areas. A halt near such a place may not be prolonged except with the agreement of the competent authorities. The same rule shall apply if a transport unit is loaded with more than 2,000 kg of substances of 3°, 4°, 13° and 14°.

52 510-
52 599

Section 6: Transitional provisions, derogations and provisions peculiar to certain countries

(Only the general provisions of Part I apply.)

52 600-
60 999"

61 130 Delete this marginal and its heading.

61 403 Paragraph (1) and (2) replaced by following text:

"Packages bearing a label conforming to models Nos. 6.1 or 6.1A shall not be loaded together on the same vehicle with packages bearing a label conforming to models Nos. 1, 1.4, 1.5 or 01."

61 500 Amend the headings before this marginal to read:

"Section 5: Special provisions concerning the operation of (tank-) vehicles and (tank-) containers

Marking and labelling

Marking

Before (2) insert sub-heading "Labelling" and after "demountable tanks" add " and tank-containers".

61 500 (cont'd) At the end of (2) add the following paragraph:

"Those containing or having contained thallium nitrate of 53° shall in addition bear labels conforming to model No. 05."

62 403 Marginal and heading deleted

71 118 Marginal and heading deleted (text transfered to 71 500 (2)).

71 130 Marginal and heading deleted (text transfered to 71 500 (3)).

71 315 Insert the following new heading and marginal:

"Special training of drivers

71 315 As from 1 January 1995, the provisions of paragraphs (1), (3), (4)(a) to(m) and (5) of marginal 10 315 shall apply to drivers of vehicles carrying packaged material of Class 7, Schedules 5 to 13."

71 403 Amend to read:

"Packages bearing a label conforming to models Nos. 7A, 7B or 7C shall not be loaded together on the same vehicle with packages bearing a label conforming to models Nos.1, 1.4, 1.5 or 01."

71 500 This marginal and its headings are amended as follows:

"Section 5: Special provisions concerning the operation of (tank-) vehecles and (tank-) containers

Marking and labelling

Labelling

71 500 (1) - existing text of 71 500, plus the following addidional sentence:
"In addition to the provisions of marginal 10 500 (1) concerning the reduction in size of the orange-coloured plate, the label conforming to model No. 7D may also be reduced to 100 mm for each side."

(2) - existing text of 71 118, but amend "10 118(5)" to read "10 500(8)"

(3) - existing text of 71 130

Amend marginal 71 507 to read:

71 507 In addition to marginal 10 507, see Appendix A.7 marginal 3712. These requirements shall, however, not apply to vehicles carrying only radioactive material of Schedules 1 to 4 of marginal 2704.

81 130 Marginal and heading deleted.

81 403 Amend paragraph (1) to read:

"Packages bearing a label conforming to model No. 8 shall not be loaded together on the same vehicle with packages bearing a label conforming to models Nos. 1, 1.4, 1.5 or 01."

81 414 Amend to read:

"Packages containing substances of 2°(a), 3°(a) or 61° shall ..."etc.

81 500 Amend the headings before this marginal to read:

"Section 5: Special provisions concerning the operation of (tank-) vehicles and (tank-) containers

Marking and labelling

Labelling"

In the first sentence, after "demountable tanks" add "and tank-containers".

Delete the last sentence.

Add the following new marginal: 91 111

"Carriage in bulk

91 111 Substances of 4°(c) may be carried in bulk in open but sheeted vehicles with adequate ventilation."

Add the following new marginal:

"Carriage in containers

91 118 Substances of 4°(c) may also be packed without inner packaging in small containers of the closed type with complete walls."

91 130 Marginal and heading deleted.

91 240 Amend to read:

"The provisions of marginal 10 240 (1)(b) and (3) are applicable only to substances of 4°(c)."

91 403 Amend to read:

Packages bearing a label conforming to model No. 9 shall not be loaded together on the same vehicle with packages bearing a label conforming to models Nos. 1, 1.4, 1.5 or 01."

91 410 Amend the first line to read:

"Packages bearing a label conforming to model No. 9 shall be kept ...."

91 500 Amend this marginal and the headings before it to read:

"Section 5: Special provisions concerning the operation of (tank-) vehicles and (tank-) containers

Marking and labelling

Marking

(1) Small containers containing expandable polymers of 4°(c) shall bear the marking: "Keep away from any source of ignition". This marking shall be in the official language of the country of departure, 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.

Labelling

(2) Vehicles with fixed or demountable tanks and tank-containers containing or having contained substances of this class, with the exception of substances of 4°(c), shall bear labels conforming to model No. 9.

Those containing or having contained substances of 2°(b) with a flash-point of 55°C or lower shall in addition bear labels conforming to model No. 3."

APPENDIX B.1a

211 125 (1) Amend to read:

"For all metals and alloys, the stress σ at the test pressure shall be lower than the smaller of the values given by the following formulae:

$$\sigma < 0.75\ Re \text{ or } \sigma < 0.5\ Rm$$

where

Re = apparent yield stress, or 0.2%
or, in the case of austenitic steels, 1%
Rm = minimum tensile strength.

Ratios of Re/Rm exceeding 0.85 are not allowed for steels used in the construction of welded tanks.

The values of Re and Rm to be used shall be specified minimum values according to material standards. If no material standard exists for the metal or alloy in question, the values of Re and Rm used shall be approved by the competent authority or by a body designated by that authority.

When austenitic steels are used, the specified minimum values according to the material standards may be exceeded by up to 15% if these higher values are attested in the inspection certificate.

The values specified in the certificate shall be taken as a basis in determining the Re/Rm ratio in each case."

(2) Amend to read:

"When the maximum working temperature of the shell does not exceed 50° C, the values of Re and Rm at 20° C may be used; when the working temperature exceeds 50° C, the values at this maximum working temperature (calculation temperature) shall be used."

211 127 (3) Beginning of the second sentence, read:

"Where the diameter is more than 1.80 m (2), this thickness shall be increased to 6 mm except in the case of shells intended for the carriage of powdery or granular substances, if the shell is of mild steel (3) ...(remainder unchanged)"

(5) Amend the beginning to read:

"For tanks built after 1 January 1990, there is protection ...." (remainder unchanged)

(9) Add:

"Unless otherwise prescribed in the special provisions for the individual classes, these shells may have valves to avoid an unacceptable negative internal pressure, without intervening bursting discs."

211 131 After the first sentence, insert:

"The bottom discharge of shells intended for the carriage of powdery or granular substances may be constituted by external piping with a stop-valve if it is made of a malleable metallic material."

In footnote 5/, delete the words: "and of powdery or granular substances."

211 154 Add a final sentence to read:

"These certificates shall refer to the list of the substances permitted for carriage in this shell in accordance with 211 140."

211 160 After "- stamp of the expert who carried out the tests; "delete "and" and insert:

"- test pressure on the shell as a whole and test pressure by compartment in MPa or bar (gauge pressure) where the pressure by compartment is less than the pressure on the shell; and"

211 180 In the first sentence, replace "during a period of six years" by "until 30 September 1984" and delete the rest of the sentence. In the second sentence: replace "for 12 years" by "until 30 September 1990" and delete the phrase "from the same date".

211 181 [concerns the French text only]

211 183 Replace "during a period of 15 years" by "until 30 September 1993" and delete "from 1 October 1978".

211 186 "Fixed tanks (tank-vehicles), demontable tanks and batteries of receptacles, constructed before the entry into
(new) force of the provisions applicable from 1 January 1993 which do not conform to those provisions but were constructed according to the provisions of ADR in force until that date may still be used."

211 210

Before:	Insert:
"and silicon tetrafluoride"	", nitrogen trifluoride"
"boron trichloride"	"octafluorobut-2-ene (R1318) and octafluoropropane of 3°(a);"
"nitrosyl chloride"	"hexafluoroacetone,"
"methylsilane"	"2,2-dimethylpropane and"
"dichlorosilane"	"carbonyl sulphide,"
"cyanogen chloride"	"propadiene, inhibited, of 3°(c);"

Amend "cyanogen and ethylene oxide" to read "Cyanogen, ethylene oxide and hydrogen iodide, anhydrous,"

After "of 4°(bt)" insert "propadiene with 1% to 4% methyl acetylene, stabilized , of 4°(c);"

211 233 (1) At the end of the last sentence, insert "*" and add the following footnote:

"*/ These requirements are published in the IMDG Code."

211 251 (2)(b) The last entry in the table, "Dichlorodifluoromethane containing ..." is deleted and replaced by the following, to be inserted before "Mixtures of methyl bromide and chloropicrin":

"Mixtures of dichlorodifluoromethane and ethylene oxide with not more than 12% ethylene oxide by mass	4°(at)	1.5	1.6	1.09"

Insert the following entries:

after "Chloropentafluoroethane ...":

"1-Chloro-1,2,2,2-tetrafluoroethane (R124)	3°(a)	1	1.1	1.2"

After "Octafluorocyclobutane ...":

"1,1,1,2-Tetrafluoroethane (R134a)	3°(a)	1.6	1.8	1.04"

(3)(b) Add:

"Pentafluoroethane (R125)	5°(a)		3.4	0.95

211 260 (1) (2nd line)
211 260 (2) (2nd line)
211 261 (antepenultimate line)
211 262 (b) (2nd line)
(c) (2nd line)

After "in full" insert "12/" and add footnote as follows:

"12/ The descriptions underlined in marginal 2201 shall be used as the full name of the gas for mixtures A, A0 and C of 4°(b) of marginal 2201. The names customary in the trade and mentioned in the Note to 4°(b) of marginal 2201 may be used only as a complement."

Marginals 211 400 to 211 599 are replaced by the following:

"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

211 400-
211 409

Section 1: General scope (use of tanks); definitions

Use

211 410 The following substances of marginals 2401, 2431 and 2471 may be carried in fixed or demountable tanks:

(a) the substances listed under letter (a) of 6°, 17°, 19° and 31° to 33° of marginal 2431;

(b) the substances of 11°(a) and 22° of marginal 2431;

211 410 (cont'd)

(c) the substances listed under letter (a) of 1°, 2°, 3°, 21°, 23° and 25° of marginal 2471;

(d) the substances of 11°(a) of marginal 2471;

(e) the substances listed under letter (b) or (c) of 6°, 8°, 10°, 17°, 19° and 21° of marginal 2431 and of 3°, 21°, 23° and 25° of marginal 2471;

(f) the substances of 5° and 15° of marginal 2401;

(g) powdery and granular substances listed under letter (b) or (c) of :

1°, 6°, 7°, 8°, 11°, 12°, 13°, 14°, 16° and 17° of marginal 2401,

1°, 5°, 7°, 9°, 12°, 13°, 14°, 15°, 16°, 18° and 20° of marginal 2431,

11°, 12°, 13°, 14°, 15°, 16°, 17°, 19°, 20°, 22° and 24° of marginal 2471.

NOTE: For the carriage in bulk of substances of:

4° (c), 6° (c), 11° (c), 12° (c), 13° (c) and 14° (c) and solid wastes classified under (c) of these items of marginal 2401,

1° (c), 2° (c), 3° (c), 12° (c) and 16° (c), and solid wastes classified under (c) of these items of marginal 2431,

11° (c), 12° (c), 13° (b) and (c), 14° (c), 15° (c), 17° (b) and 20° (c) of marginal 2471,

see marginals 41 111, 42 111 and 43 111.

211 411 - 211 419

Section 2: Construction

211 420 Shells intended for the carriage of the substances referred to in 211 410 (a) shall be designed for a calculation pressure (see 211 127 (2)) of not less than 2.1 MPa (21 bar) (gauge pressure).

The requirements of Appendix B.1d are applicable to the materials and construction of these shells.

211 421 Shells intended for the carriage of the substances referred to in 211 410 (b), (c) and (d) shall be designed for a calculation pressure (see 211 127 (2)) of not less than 1 MPa (10 bar) (gauge pressure).

211 422 Shells intended for the carriage of the substances referred to in 211 410 (e) shall be designed for a calculation pressure (see 211 127 (2)) of not less than 400 kPa (4 bar) (gauge pressure).

211 423 Shells intended for the carriage of the solids referred to in 211 410 (f) and (g) shall be designed in conformity with the requirements of Part I of this Appendix.

211 424 Shells intended for the carriage of substances of marginal 2431, 1°(b) shall be connected to all parts of the vehicle by equipotential connections and shall be capable of being electrically earthed.

211 425–
211 429

Section 3: Items of equipment

211 430 All openings of shells intended for the carriage of the substances referred to in 211 410 (a), (b), (c) and (e) shall be above the surface level of the liquid. No pipes or pipe connections shall pass through the walls of the shell below the surface level of the liquid. Shells shall be capable of being hermetically closed (6) and the closure shall be capable of being protected with lockable caps. The cleaning apertures (fist-holes) referred to in 211 132 shall not be permitted.

211 431 With the exception of shells intended for the carriage of caesium and rubidium of marginal 2471, 11° (a), shells intended for the carriage of substances referred to in 211 410 (d), (f) and (g) may also be of the bottom-discharge type. The openings of shells intended for the carriage of caesium and rubidium of marginal 2471, 11° (a) shall be equipped with hermetically (6) closing and lockable caps.

211 432 Shells intended for the carriage of the substances referred to in 211 410 (b) shall in addition meet the following requirements:

(1) The heating device shall not penetrate into, but shall be exterior to, the body of the shell. However, a pipe used for extracting the phosphorus may be equipped with a heating jacket. The device heating the jacket shall be so regulated as to prevent the temperature of the phosphorus from exceeding the filling temperature of the shell. Other piping shall enter the shell in its upper part; openings shall be situated above the highest permissible level of the phosphorus and be capable of being completely enclosed under lockable caps. In addition, the cleaning apertures (fist-holes) referred to in 211 132 shall not be permitted.

(2) The shell shall be equipped with a gauging system for verifying the level of the phosphorus and, if water is used as a protective agent, with a fixed gauge mark showing the highest permissible level of the water.

211 433 If shells intended for the carriage of the substances referred to in 211 410 (a), (c) and (e) are fitted with safety valves, a bursting disc shall be placed before the valve. The arrangement of the bursting disc and safety valve shall be such as to satisfy the competent authority.

211 434 Shells intended for the carriage of the subtances referred to in 211 410 (b) and (f) shall be equipped with thermal insulation made of materials which are not readily flammable.

211 435 If shells intended for the carriage of substances referred to in 211 410 (d) are equipped with thermal insulation, such insulation shall be made of materials which are not readily flammable.

211 436 Shells intended for the carriage of the substances referred to in 211 410 (f) may be equipped with valves 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).

211 437-
211 439

Section 4: Type approval

211 440-
211 449 (No special requirements.)

Section 5: Tests

211 450 Shells intended for the carriage of the substances referred to in 211 410 (a) shall be subjected to the initial and periodic hydraulic pressure tests at a gauge pressure of at least 1 MPa (10 bar). The materials of each of these shells shall be tested by the method described in Appendix B.1d.

211 451 Shells intended for the carriage of the substances referred to in 211 410 (b) to (e) shall be subjected to the initial and periodic hydraulic pressure tests at a gauge pressure of at least 400 kPa (4 bar).

By derogation from the requirements of 211 151, shells intended for the carriage of substances referred to in 211 410 (d) shall undergo periodic inspections at least every eight years which shall include a thickness check using suitable instruments. For such shells, the leakproofness test and check, for which provision is made in 211 152, shall be carried out at least every four years

211 452 Shells intended for the carriage of the substances referred to in 211 410 (f) and (g) shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 211 123.

211 453-
211 459

Section 6: Marking

211 460 Shells intended for the carriage of the substances referred to in 211 410 (a) shall bear in addition to the particulars prescribed in marginal 211 161, the words: "Do not open during carriage. Liable to spontaneous combustion." Shells intended for the carriage of the substances referred to in 211 410 (c) to (e) shall bear in addition to the particulars prescribed in 211 161, the words: "Do not open during carriage. Gives off flammable gases on contact with water."

211 460 (cont'd) These particulars shall be in an official language of the country of approval, 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.

211 461 Shells intended for the carriage of substances of marginal 2471, 1° (a) shall also bear, on the plate prescribed in 211 160, the names of the approved substances and the maximum permissible load of the shell in kg.

211 462–
211 469

Section 7: Operation

211 470 (1) Substances of 11° and 22° of marginal 2431 shall, if water is used as a protective agent, be covered with a depth of not less than 12 cm of water at the time of filling; the degree of filling at a temperature of 60° C shall not exceed 98%. If nitrogen is used as a protective agent, the degree of filling at a temperature of 60° C shall not exceed 96%. The remaining space shall be filled with nitrogen in such a way that, even after cooling, the pressure at no time falls below atmospheric pressure. The shell shall be hermetically closed (6), so that no leakage of gas occurs.

(2) Uncleaned empty shells which have contained substances of 11° and 22° of marginal 2431 shall, when handed over for carriage, either:

- be filled with nitrogen; or

- be filled with water to not less than 96% and not more than 98% of their capacity; between 1 October and 31 March, this water shall contain sufficient anti-freeze agent to make it impossible for the water to freeze during carriage; the anti-freeze agent shall be free from corrosive action and not liable to react with phosphorus.

211 471 Shells containing substances of 31° to 33° of marginal 2431 and substances of 2° (b), 3° (a) and 3°(b) of marginal 2471 shall be filled to not more than 90% of their capacity; a space of 5% shall remain empty for safety when the liquid is at an average temperature of 50°C. During carriage, the substances shall be under a layer of inert gas, the gauge pressure of which shall not be less than 50 kPa (0.5 bar). The shells shall be hermetically closed (6) and the protective caps conforming to 211 430 shall be locked. Uncleaned empty shells shall when handed over for carriage be filled with an inert gas at a gauge pressure of at least 50 kPa (0.5 bar).

211 472 For ethyldichlorosilane, methyldichlorosilane and trichlorosilane of marginal 2471, 1°, the degree of filling shall not exceed 0.93 or 0.95 or 1.14 kg per litre of capacity respectively, if filling is by mass. If filling is by volume, and for chlorosilanes not mentioned by name (n.o.s.) of marginal 2471, 1°, the rate of filling shall not exceed 85%. The shells shall be hermetically closed (6) and the protective caps conforming to 211 430 shall be locked.

211 473 Shells containing substances of marginal 2401, 5° and 15°, shall not be filled to more than 98% of their capacity.

211 474 For the carriage of caesium and rubidium of marginal 2471 11°(a), the substance shall be covered by an inert gas and the caps conforming to 211 431 shall be locked. Shells containing other substances of marginal 2471, 11° (a) shall not be handed over for carriage until the substance has solidified completely and been covered by an inert gas.

Uncleaned empty shells which have contained substances of marginal 2471, 11°(a) shall be filled with an inert gas. The shells shall be hermetically closed.

211 475 When substances of marginal 2431, 1°(b) are being loaded, the temperature of the goods being loaded shall not exceed 60°C.

211 476–
211 499

Class 5.1: Oxidizing substances

Class 5.2: Organic peroxides

211 500–
211 509

Section 1: General; scope (use of tanks); definitions

Use

211 510 The following substances of marginal 2501 may be carried in fixed or demountable tanks:

(a) substances of 5°;

(b) the highly oxidizing or oxidizing substances listed under letter (a) or (b) of 1° to 4°, 11°, 13°, 16°, 17°, 22° and 23°, carried in the liquid state, and liquid substances and solutions assimilable under (a) or (b) of these items;

(c) ammonium nitrate liquid of 20°;

(d) slightly oxidizing substances listed under letter (c) of 1°, 16°, 18°, 22° and 23°, carried in the liquid state, and liquid substances and solutions assimilable under (c) of these items;

(e) oxidizing and slightly oxidizing substances in powdery or granular form listed under letter (b) or (c) of 11°, 13° to 19°, 21° to 27°, 29° and 31°, as well as powdery or granular substances assimilable under (b) or (c) of these items.

NOTE: For the carriage in bulk of substances of 11° to 13°, 16°, 18°, 19°, 21° and 22° (c), and of solid wastes classified in the aforementioned items of marginal 2501, see marginal 51 111.

211 511 Substances of 9°(b), 10°(b), 19°(b) or 20° b) of marginal 2551 may be carried in fixed or demountable tanks at the latest from 1 January 1995 under conditions laid down by the competent authority of the country of origin if, on the basis of tests (see 211 541), the competent authority is satisfied that such a transport operation can be carried out safely. If the country of origin is not party to ADR, these conditions shall be recognized by the competent authority of the first ADR country reached by the consignment.

211 512-
211 519

Section 2: Construction

211 520 Shells intended for the carriage of the substances referred to in 211 510 (a) shall be designed for a calculation pressure (see 211 127(2)) of at least 1 MPa (10 bar) (gauge pressure).

211 521 Shells intended for the carriage of the substances referred to in 211 510 (b) shall be designed for a calculation pressure (see 211 127(2)) of at least 400 kPa (4 bar) (gauge pressure). Shells, and their items of equipment, intended for the carriage of substances of 1° shall be made of aluminium not less than 99.5% pure or of suitable steel not liable to cause hydrogen peroxide to decompose. Where shells are made of aluminium not less than 99.5% pure, the wall thickness need not be greater than 15 mm, even where calculation in accordance with 211 127 (2) gives a higher value.

211 522 Shells intended for the carriage of the substances referred to in 211 510 (c) shall be designed for a calculation pressure (see 211 127 (2)) of at least 400 kPa (4 bar) (gauge pressure). The shells shall be made of austenitic steel.

211 523 Shells intended for the carriage of the liquids referred to in 211 510 (d) and the powdery or granular substances referred to in 211 510 (e) shall be designed in accordance with the requirements of Part I of this Appendix.

211 524 Shells intended for the carriage of substances referred to in 211 511 shall be designed for a calculation pressure of at least 400 kPa (4 bar) (gauge pressure).

211 525-
211 529

Section 3: Items of equipment

211 530 Shells intended for the carriage of substances of 1°(a), 3°(a) and 5° of marginal 2501 shall have their openings above the surface level of the liquid. In addition, the cleaning apertures (fist holes) referred to in 211 232 shall not be permitted.

211 530 (contd) For solutions containing more than 60% but not more than 70% hydrogen peroxide, openings below the surface level of the liquid shall be permissible. In this case the shell-discharge system shall be equipped with two mutually independent shut-off devices mounted in series, the first taking the form of a quick-closing internal stop-valve of an approved type and the second that of a sluice-valve, one at each end of the discharge pipe. A blank flange, or another device providing the same measure of security, shall also be fitted at the outlet of each external sluice-valve. The internal stop-valve shall be such that if the pipe is wrenched off the stop-valve will remain integral with the shell and in the closed position. The connections to the external pipe-sockets of shells shall be made of materials not liable to cause decomposition of hydrogen peroxide.

211 531

211 532 Shells intended for the carriage of hydrogen peroxide or aqueous solutions of hydrogen peroxide of 1°, or of ammonium nitrate liquid of 20° of marginal 2501 shall be fitted in their upper part with a shut-off device preventing any build-up of excess pressure inside the shell, any leakage of liquid, and any entry of foreign matter into the shell. The shut-off devices of shells intended for the ammonium nitrate liquid of marginal 2501, 20°, shall be so designed as to preclude obstruction of the devices by solidified ammonium nitrate during carriage.

211 533 Where shells intended for the carriage of ammonium nitrate liquid of marginal 2501, 20°, are sheathed in thermally-insulating material, the material shall be of an inorganic nature and entirely free from combustible matter.

211 534 Shells intended for the carriage of substances referred to in 211 511 shall be equipped with thermal insulation complying with the requirements of 211 234 (1). If the SADT of the organic peroxide in the shell is 55°C or less, or the shell is constructed of aluminium, the shell shall be completely insulated. The sun shield and any part of the shell not covered by it, or the outer sheathing of a complete lagging, shall be painted white or finished in bright metal. The paint shall be cleaned before each transport journey and renewed in case of yellowing or deterioration. The thermal insulation shall be free from combustible matter.

211 535 Shells intended for the carriage of substances referred to in 211 511 shall be fitted with temperature sensing devices.

211 536 (1) Shells intended for the carriage of substances referred to in 211 511 shall be fitted with safety valves and pressure-relief devices. Vacuum-relief devices may also be used. Pressure-relief devices shall operate at pressures determined according to both the properties of the organic peroxide and the construction characteristics of the tank. Fusible elements shall not be permitted in the body of the shell.

211 536 (contd) (2) Shells intended for the carriage of substances referred to in 211 511 shall be fitted with spring-loaded safety valves to prevent significant pressure build-up within the shell of the decomposition products and vapours released at a temperature of 50°C. The capacity and start-to-discharge pressure of the safety-valve(s) shall be based on the results of the tests specified in 211 541. The start-to-discharge pressure shall however in no case be such that liquid could escape from the valve(s) if the shell were overturned.

(3) The pressure-relief devices of shells intended for the carriage of substances referred to in 211 511 may be of the spring-loaded type or bursting disc type, designed to vent all the decomposition products and vapours evolved during a period of not less than one hour of fire engulfment (heat load 110 kW/m^2) or self-accelerating decomposition. The start-to-discharge pressure of the pressure-relief device(s) shall be higher than that specified in paragraph (2) and based on the results of the tests referred to in 211 541. The dimensions of the pressure-relief devices shall be such that the maximum pressure in the shell never exceeds the test pressure of the shell.

(4) For shells with an insulation consisting of a complete cladding intended for the carriage of substances referred to in 211 511, the capacity and setting of the pressure-relief device(s) shall be determined assuming a loss of insulation from 1% of the surface area.

(5) Vacuum-relief devices and spring-loaded safety valves of shells for the carriage of substances referred to in 211 511 shall be provided with flame arresters unless the substances to be carried and their decomposition products are non-combustible. Due attention shall be paid to the reduction of the relief capacity caused by the flame arrester.

211 537-
211 539

Section 4: Type approval

211 540-

211 541 For the type approval of shells intended for the carriage of substances referred to in 211 511, tests shall be undertaken:

- to prove the compatibility of all materials normally in contact with the substance during carriage;

- to provide data to facilitate the design of the pressure-relief devices and safety valves taking into account the design characteristics of the tank; and

- to establish any special requirements necessary for the safe carriage of the substance.

The test results shall be included in the report for the type approval of the tank.

211 542-
211 549

Section 5: Tests

211 550 Shells intended for the carriage of the substances referred to in 211 510 (a), (b) and (c) shall be subjected to the initial and periodic hydraulic pressure tests at a pressure of not less than 400 kPa (4 bar) (gauge pressure). Shells of pure aluminium intended for the carriage of substances of marginal 2501, 1°, may be subjected to the initial and periodic hydraulic pressure tests at a pressure of only 250 kPa (2.5 bar) (gauge pressure).

Shells intended for the carriage of the substances referred to in 211 510 (d) and (e) shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 211 123.

211 551 Shells intended for the carriage of substances referred to in 211 511 shall be subjected to the initial and periodic hydraulic pressure tests at the calculation pressure as defined in 211 524.

211 552-
211 559

Section 6: Marking

211 560 For shells intended for the carriage of substances referred to in 211 511, the following additional particulars shall be marked by stamping or by any other similar method on the plate prescribed in 211 161 or directly on the walls of the shell itself, if the walls are so reinforced that the strength of the shell is not impaired:

- the chemical name with the approved concentration of the substance concerned.

211 561-
211 569

Section 7: Operation

211 570 The inside of the shell and all parts liable to come into contact with the substances referred to in marginals 211 510 and 211 511 shall be kept clean. No lubricant capable of combining dangerously with the substance carried shall be used for pumps, valves or other devices.

211 571 Shells intended for the carriage of substances of 1° (a), 2° (a) and 3° (a) of marginal 2501 shall be filled to not more than 95% of their capacity at a reference temperature of 15°C. Shells intended for the carriage of substances of marginal 2501, 20°, shall be filled to not more than 97% of their capacity, and the maximum temperature after filling shall not exceed 140°C. Shells approved for the carriage of ammonium nitrate liquid shall not be used for the carriage of other substances without being first carefully cleansed of any residues.

211 572 Shells intended for the carriage of substances referred to in 211 511 shall be filled as set out in the test report for the type approval of the tank but shall be filled to not more than 90% of their capacity. Shells shall be free from impurities at the time of filling.

211 573 Service equipment such as valves and external piping of shells intended for the carriage of substances referred to in 211 511 shall be emptied after filling or discharging of the tank.

211 574-
211 599"

211 810 (c) Amend "55° and 61° to 66°" to read:

"55°, 61° and 63° to 66°"

211 822 Delete the 3rd subparagraph.

211 834 Delete "and of aqueous solutions of hydrogen peroxide of 62°".

211 851 In the second paragraph, delete "and of aqueous solutions of hydrogen peroxide of 62°"

211 910 Read:

"substances of 1°. 2° and 4°(c) of marginal 2901 may be carried in fixed or demountable tanks.

NOTE: For the carriage in bulk of substances of 4° (c) of marginal 2901, see marginal 91 111."

211 920 Read:

"Shells intended for the carriage of substances of 1° and 4 (c) shall be designed in accordance with the requirements of Part I of this Appendix."

211 930 Read:

"Shells intended for the carriage of substances of 1° and 2° shall be capable of being hermetically closed (6). Shells intended for the carriage of substances of 4° (c) shall be equipped with a safety valve.

211 931 Amend the first sentence to read:

"If shells intended for the carriage of substances of 1° and 2° are fitted with safety valves, a bursting disc shall be placed before the valves."

211 951 Read:

"Shells intended for the carriage of substances of 1° and 4° (c) shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 211 123."

211 970 Read:

"Shells intended for the carriage of substances of 1° and 2° shall be hermetically closed (6) during carriage."

APPENDIX B.1b

Part 1, section 1: "Note" becomes "NOTE 1:" Add:

"NOTE 2: For the purposes of ADR, tank swap bodies are considered as tank-containers."

212 125 (1) Amend to read:

"For all metals and alloys, the stress σ at the test pressure shall be lower than the smaller of the values given by the following formulae:

$$\sigma < 0.75\ Re \text{ or } \sigma < 0.5\ Rm$$

where

Re = apparent yield stress, or 0.2%
or, in the case of austenitic steels, 1%
Rm = minimum tensile strength.

Ratios of Re/Rm exceeding 0.85 are not allowed for steels used in the construction of welded tanks.

The values of Re and Rm to be used shall be specified minimum values according to material standards. If no material standard exists for the metal or alloy in question, the values of Re and Rm used shall be approved by the competent authority or by a body designated by that authority.

When austenitic steels are used, the specified minimum values according to the material standards may be exceeded by up to 15% if these higher values are attested in the inspection certificate.

The values specified in the certificate shall be taken as a basis in determining the Re/Rm ratio in each case."

(2) Amend to read:

"When the maximum working temperature of the shell does not exceed 50° C, the values of Re and Rm at 20° C may be used; when the working temperature exceeds 50° C, the values at this maximum working temperature (calculation temperature) shall be used."

212 127 (3) Amend the beginning of the second sentence to read:

"Where the diameter is more than 1.80 m2/, this thickness shall be increased to 6 mm except in the case of shells intended for the carriage of powdery or granular substances, if the shell is of mild steel3/.. (remainder unchanged)"

(7) Add:

"Unless otherwise prescribed in the special provisions for the individual classes, these shells may have valves to avoid an unacceptable negative internal pressure, without intervening bursting discs."

212 131 After the first sentence, insert:

"The bottom discharge of shells intended for the carriage of powdery or granular substances may be constituted by external piping with a stop-valve if it is made of a malleable metal material."

In footnote 5/, delete the words "and powdery or granular substances."

212 154 Add a final sentence to read:

"These certificates shall refer to the list of the substances permitted for carriage in this shell in accordance with 212 140."

212 181 (new) "Tank-containers constructed before the entry into force of the provisions applicable from 1 January 1993 which do not conform to those provisions but were constructed according to the requirements of ADR in force until that date may still be used."

212 210

Before:	Insert:
"and silicon tetrafluoride"	", nitrogen trifluoride"
"boron trichloride"	"octafluorobut-2-ene (R1318) and octafluoropropane of 3°(a);"
"nitrosyl chloride"	"hexafluoroacetone,"
"methylsilane"	"2,2-dimethylpropane and"
"dichlorosilane"	"carbonyl sulphide,"
"cyanogen chloride"	"propadiene, inhibited, of 3°(c);"

Amend "cyanogen and ethylene oxide" to read "Cyanogen, ethylene oxide and hydrogen iodide, anhydrous,"

After "of 4°(bt)" insert "propadiene with 1% to 4% methyl acetylene, stabilized , of 4°(c);"

212 233 (1) At the end of the last sentence, insert "*" and add the following footnote:

"*/ These requirements are published in the IMDG Code."

212 251 (2)(b) The last entry in the table, "Dichlorodifluoromethane containing ..." is deleted and replaced by the following, to be inserted before "Mixtures of methyl bromide and chloropicrin":

"Mixtures of dichlorodifluoromethane and ethylene oxide with not more than 12% ethylene oxide by mass	4°(at)	1.5	1.6	1.09"

Insert the following entries:

after "Chloropentafluoroethane ...":

"1-Chloro-1,2,2,2-tetrafluoroethane (R124)	3°(a)	1	1.1	1.2"

212 251 (cont'd) After "Octafluorocyclobutane ...":

"1,1,1,2-Tetrafluoroethane (R134a)		3°(a)	1.6	1.8	1.04"
(3)(b) Add:					
"Pentafluoroethane (R125)		5°(a)		3.4	0.95

212 260 (1) (2nd line)
(2) (2nd line)
212 261 (antepenultimate line
212 262 (b) (2nd line)
(c) (2nd line)

After "in full" insert "17/" and add footnote as follows:

"17/ The descriptions underlined in marginal 2201 shall be used as the full name of the gas for mixtures A, A0 and C of 4°(b) of marginal 2201. The names customary in the trade and mentioned in the Note to 4°(b) of marginal 2201 may be used only as a complement."

Marginals 212 400 to 212 599 are replaced by the following:

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

212 400-
212 409

Section 1: General, scope (use of tank-containers); definitions

Use

212 410 The following substances of marginals 2401, 2431 and 2471 may be carried in tank containers:

(a) the substances listed under letter (a) of 6°, 17°, 19° and 31° to 33° of marginal 2431;

(b) the substances of 11° (a) and 22° of marginal 2431;

(c) the substances listed under letter (a) of 1°, 2°, 3°, 21°, 23° and 25° of marginal 2471;

(d) the substances of 11° (a) of marginal 2471;

(e) the substances listed under letter (b) or (c) of 6°, 8°, 10°, 17°, 19° and 21° of marginal 2431, and 3°, 21°, 23° and 25° of marginal 2471;

(f) the substances of 5° and 15° of marginal 2401;

212 410 (cont'd) (g) powdery and granular substances listed under letter (b) or (c) of:

1°, 6°, 7°, 8°, 11°, 12°, 13°, 14°, 16° and 17° of marginal 2401,

1°, 5°, 7°, 9°, 12°, 13°, 14°, 15°, 16°, 18° and 20° of marginal 2431,

11°, 12°, 13°, 14°, 15°, 16°, 17°, 19°, 20°, 22° and 24° of marginal 2471.

NOTE: For the carriage in bulk of substances of

4° (c), 6° (c), 11° (c), 12° (c), 13° (c) and 14° (c) and solid wastes classified under (c) of these items of marginal 2401,

1° (c), 2° (c), 3° (c), 12° (c) and 16° (c), and solid wastes classified under (c) of these items of marginal 2431,

11° (c), 12° (c), 13° (b) and (c), 14° (c), 15° (c), 17° (b) and 20° (c) of marginal 2471,

see marginals 41 111, 42 111 and 43 111.

212 411
212 419

Section 2: Construction

212 420 Shells intended for the carriage of the substances referred to in 212 410 (a) shall be designed for a calculation pressure (see 212 127 (2)) of not less than 2.1 MPa (21 bar) (gauge pressure).

The requirements of Appendix B.1d are applicable to the materials and construction of these shells.

212 421 Shells intended for the carriage of the substances referred to in 212 410 (b), (c) and (d) shall be designed for a calculation pressure (see 212 127 (2)) of not less than 1 MPa (10 bar) (gauge pressure).

212 422 Shells intended for the carriage of the substances referred to in 212 410 (e) shall be designed for a calculation pressure (see 212 127 (2)) of not less than 400 kPa (4 bar) (gauge pressure).

212 423 Shells intended for the carriage of the solids referred to in 212 410 (f) and (g) shall be designed in conformity with the requirements of Part 1 of this Appendix.

212 424 All parts of the tank-container intended for the carriage of substances of marginal 2431, 1°(b) shall be capable of being electrically earthed.

212 425
212 429

Section 3: Items of equipment

212 430 All openings of shells intended for the carriage of the substances referred to in 212 410 (a), (b), (c) and (e) shall be above the surface level of the liquid. No pipes or pipe connections shall pass through the walls of the shell below the surface level of the liquid. Shells shall be capable of being hermetically closed (7) and the closure shall be capable of being protected with lockable caps. The cleaning apertures (fist-holes) referred to in marginal 212 132 shall not be permitted.

212 431 With the exception of shells intended for the carriage of caesium and rubidium of marginal 2471, 11° (a), shells intended for the carriage of substances referred to in 212 410 (d), (f) and (g) may also be of the bottom-discharge type. The openings of shells intended for the carriage of caesium and rubidium of marginal 2471, 11° (a) shall be equipped with hermetically (7) closing and lockable caps.

212 432 Shells intended for the carriage of the substances referred to in 212 410 (b) shall in addition meet the following requirements:

(1) The heating device shall not penetrate into, but shall be exterior to, the body of the shell. However, a pipe used for extracting the phosphorus may be equipped with a heating jacket. The device heating the jacket shall be so regulated as to prevent the temperature of the phosphorus from exceeding the filling temperature of the shell. Other piping shall enter the shell in its upper part; openings shall be situated above the highest permissible level of the phosphorus and be capable of being completely enclosed under lockable caps. In addition, the cleaning apertures (fist-holes) referred to in 212 132 shall not be permitted.

(2) The shell shall be equipped with a gauging system for verifying the level of the phosphorus and, if water is used as a protective agent, with a fixed gauge mark showing the highest permissible level of the water.

212 433 If shells intended for the carriage of the substances referred to in 212 410 (a), (c) and (e) are fitted with safety valves, a bursting disc shall be placed before the valve. The arrangement of the bursting disc and safety valve shall be such as to satisfy the competent authority.

212 434 Shells intended for the carriage of the subtances referred to in 212 410 (b) and (f) shall be equipped with thermal insulation made of materials which are not readily flammable.

212 435 If shells intended for the carriage of substances referred to in 212 410 (d) are equipped with thermal insulation, such insulation shall be made of materials which are not readily flammable.

212 436 Shells intended for the carriage of the substances referred to in 212 410 (f) may be equipped with valves 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).

212 437-
212 439

Section 4: Type approval

212 440-
212 449 (No special requirements.)

Section 5: Tests

212 450 Shells intended for the carriage of the substances referred to in 212 410 (a) shall be subjected to the initial and periodic hydraulic pressure tests at a gauge pressure of at least 1 MPa (10 bar). The materials of each of these shells shall be tested by the method described in Appendix B.1d.

212 451 Shells intended for the carriage of the substances referred to in 212 410 (b) to (e) shall be subjected to the initial and periodic hydraulic pressure tests at a gauge pressure of at least 400 kPa (4 bar).

By derogation from the requirements of 212 151, shells intended for the carriage of substances referred to in 212 410 (d) shall undergo periodic inspections at least every eight years which shall include a thickness check using suitable instruments. For such shells, the leakproofness test and check, for which provision is made in 212 152, shall be carried out at least every four years

212 452 Shells intended for the carriage of the substances referred to in 212 410 (f) and (g) shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 212 123.

212 453-
212 459

Section 6: Marking

212 460 Shells intended for the carriage of the substances referred to in 212 410 (a) shall bear in addition to the particulars prescribed in 212 161, the words: "Do not open during carriage. Liable to spontaneous combustion." Shells intended for the carriage of the substances referred to in 212 410 (c) to (e) shall bear in addition to the particulars prescribed in 212 161, the words: "Do not open during carriage. Gives off flammable gases on contact with water."

These particulars shall be in an official language of the country of approval, 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.

212 461 Shells intended for the carriage of substances of marginal 2471, 1° (a) shall also bear, on the plate prescribed in 212 160, the names of the approved substances and the maximum permissible load of the shell in kg.

212 462-
212 469

Section 7: Operation

212 470 (1) Substances of 11° and 22° of marginal 2431 shall, if water is used as a protective agent, be covered with a depth of not less than 12 cm of water at the time of filling; the degree of filling at a temperature of 60° C shall not exceed 98%. If nitrogen is used as a protective agent, the degree of filling at a temperature of 60° C shall not exceed 96%. The remaining space shall be filled with nitrogen in such a way that, even after cooling, the pressure at no time falls below atmospheric pressure. The shell shall be hermetically closed (7) so that no leakage of gas occurs.

(2) Uncleaned empty shells which have contained substances of 11° and 22° of marginal 2431 shall, when handed over for carriage, either:

- be filled with nitrogen; or
- be filled with water to not less than 96% and not more than 98% of their capacity; between 1 October and 31 March, this water shall contain sufficient anti-freeze agent to make it impossible for the water to freeze during carriage; the anti-freeze agent shall be free from corrosive action and not liable to react with phosphorus.

212 471 Shells containing substances of 31° to 33° of marginal 2431 and substances of 2° (b), 3° (a) and 3°(b) of marginal 2471 shall be filled to not more than 90% of their capacity; a space of 5% shall remain empty for safety when the liquid is at an average temperature of 50°C. During carriage, the substances shall be under a layer of inert gas, the gauge pressure of which shall not be less than 50 kPa (0.5 bar). The shells shall be hermetically closed (7) and the protective caps conforming to 212 430 shall be locked. Uncleaned empty shells shall when handed over for carriage be filled with an inert gas at a gauge pressure of at least 50 kPa (0.5 bar).

212 472 For ethyldichlorosilane, methyldichlorosilane and trichlorosilane of marginal 2471, 1°, the degree of filling shall not exceed 0.93 or 0.95 or 1.14 kg per litre of capacity respectively, if filling is by mass. If filling is by volume, and for chlorosilanes not mentioned by name (n.o.s.) of marginal 2471, 1°, the rate of filling shall not exceed 85%. The shells shall be hermetically closed (7) and the protective caps conforming to 212 430 shall be locked.

212 473 Shells containing substances of marginal 2401, 5° and 15°, shall not be filled to more than 98% of their capacity.

212 474 For the carriage of caesium and rubidium of marginal 2471 11°(a) , the substances shall be covered by an inert gas and the caps conforming to 212 431 shall be locked. Shells containing other substances of marginal 2471, 11° (a) shall not be handed over for carriage until the substance has solidified completely and been covered by an inert gas.

Uncleaned empty shells which have contained substances of marginal 2471, 11°(a) shall be filled with an inert gas. The shells shall be hermetically closed.

212 475 When substances of marginal 2431, 1°(b) are being loaded, the temperature of the goods being loaded shall not exceed 60°C.

212 476-
212 499

Class 5.1: Oxidizing substances

Class 5.2: Organic peroxides

212 500-
212 509

Section 1: General, scope (use of tank-containers); definitions

Use

212 510 The following substances of marginal 2501 may be carried in tank-containers:

(a) substances of 5°;

(b) the highly oxidizing or oxidizing substances listed under letter (a) or (b) of 1° to 4°, 11°, 13°, 16°, 17°, 22° and 23°, carried in the liquid state, and liquid substances and solutions assimilable under (a) or (b) of these items;

(c) ammonium nitrate liquid of 20°;

(d) slightly oxidizing substances listed under letter (c) of 1°, 16°, 18°, 22° and 23°, carried in the liquid state, and liquid substances and solutions assimilable under (c) of these items;

(e) oxidizing and slightly oxidizing substances in powdery or granular form listed under letter (b) or (c) of 11°, 13° to 19°, 21° to 27°, 29° and 31°, as well as powdery or granular substances assimilable under (b) or (c) of these items.

NOTE: For the carriage in bulk of substances of 11° to 13°, 16°, 18°, 19°, 21° and 22° (c), and of solid wastes classified in the aforementioned items of marginal 2501, see marginal 51 111.

212 511 Substances of 9°(b), 10°(b), 19°(b) or 20° (b) of marginal 2551 may be carried in tank-containers at the latest from 1 January 1995 under conditions laid down by the competent authority of the country of origin if, on the basis of tests (see 212 541), the competent authority is satisfied that such a transport operation can be carried out safely. If the country of origin is not party to ADR, these conditions shall be recognized by the competent authority of the first ADR country reached by the consignment.

212 512-
212 519

Section 2: Construction

212 520 Shells intended for the carriage of the substances referred to in 212 510 (a) shall be designed for a calculation pressure (see 212 127(2)) of at least 1 MPa (10 bar) (gauge pressure).

212 521 Shells intended for the carriage of the substances referred to in 212 510 (b) shall be designed for a calculation pressure (see 212 127(2)) of at least 400 kPa (4 bar) (gauge pressure). Shells, and their items of equipment, intended for the carriage of substances of 1° shall be made of aluminium not less than 99.5% pure or of suitable steel not liable to cause hydrogen peroxide to decompose. Where shells are made of aluminium not less than 99.5% pure, the wall thickness need not be greater than 15 mm, even where calculation in accordance with 212 127 (2) gives a higher value.

212 522 Shells intended for the carriage of the substances referred to in 212 510 (c) shall be designed for a calculation pressure (see marginal 212 127 (2)) of at least 400 kPa (4 bar) (gauge pressure). The shells shall be made of austenitic steel.

212 523 Shells intended for the carriage of the liquids referred to in 212 510 (d) and the powdery or granular substances referred to in 212 510 (e) shall be designed in accordance with the requirements of Part 1 of this Appendix.

212 524 Shells intended for the carriage of substances referred to in 212 511 shall be designed for a calculation pressure of at least 400 kPa (4 bar) (gauge pressure).

212 525-
212 529

Section 3: Items of equipment

212 530 Shells intended for the carriage of substances of 1°(a), 3°(a) and 5° of marginal 2501 shall have their openings above the surface level of the liquid. In addition, the cleaning apertures (fist holes) referred to in 212 232 shall not be permitted.

For solutions containing more than 60% but not more than 70% hydrogen peroxide, openings below the surface level of the liquid shall be permissible. In this case the shell-discharge system shall be equipped with two mutually independent shut-off devices mounted in series, the first taking the form of a quick-closing internal stop-valve of an approved type and the second that of a sluice-valve, one at each end of the discharge pipe. A blank flange, or another device providing the same measure of security, shall also be fitted at the outlet of each external sluice valve. The internal stop-valve shall be such that if the pipe is wrenched off the stop-valve will remain integral with the shell and in the closed position. The connections to the external pipe-sockets of shells shall be made of materials not liable to cause decomposition of hydrogen peroxide.

212 531

212 532 Shells intended for the carriage of hydrogen peroxide or aqueous solutions of hydrogen peroxide of 1°, or of ammonium nitrate liquid of 20° of marginal 2501 shall be fitted in their upper part with a shut-off device preventing any build-up of excess pressure inside the shell, any leakage of liquid, and any entry of foreign matter into the shell. The shut-off devices of shells intended for the carriage of ammonium nitrate liquid of marginal 2501, 20°, shall be so designed as to preclude obstruction of the devices by solidified ammonium nitrate during carriage.

212 533 Where shells intended for the carriage of ammonium nitrate liquid of marginal 2501, 20°, are sheathed in thermally insulating material, the material shall be of an inorganic nature and entirely free from combustible matter.

212 534 Shells intended for the carriage of substances referred to in 212 511 shall be equipped with thermal insulation complying with the requirements of 212 234 (1). If the SADT of the organic peroxide in the shell is 55°C or less, or the shell is constructed of aluminium, the shell shall be completely insulated. The sun shield and any part of the shell not covered by it, or the outer sheathing of a complete lagging, shall be painted white or finished in bright metal. The paint shall be cleaned before each transport journey and renewed in case of yellowing or deterioration. The thermal insulation shall be free from combustible matter.

212 535 Shells intended for the carriage of substances referred to in 212 511 shall be fitted with temperature sensing devices.

212 536 (1) Shells intended for the carriage of substances referred to 212 511 shall be fitted with safety valves and pressure relief devices. Vacuum-relief devices may also be used. Pressure relief devices shall operate at pressures determined according to both the properties of the organic peroxide and the construction characteristics of the tank. Fusible elements shall not be permitted in the body of the shell.

(2) Shells intended for the carriage of substances referred to in 212 511 shall be fitted with spring-loaded safety valves to prevent significant pressure build-up within the shell of the decomposition products and vapours released at a temperature of 50°C. The capacity and start-to-discharge pressure of the safety-valve(s) shall be based on the results of the tests specified in 212 541. The start-to-discharge pressure shall however in no case be such that liquid could escape from the valve(s) if the shell were overturned.

(3) The pressure relief devices of shells intended for the carriage of substances referred to in 212 511 may be of the spring-loaded type or bursting disc type, designed to vent all the decomposition products and vapours evolved during a period of not less than one hour of fire engulfment (heat load 110 kW/m^2) or self-accelerating decomposition. The start-to-discharge pressure of the pressure relief device(s) shall be higher than that specified in paragraph (2) and based on the results of the tests referred to in 212 541. The dimensions of the pressure relief devices shall be such that the maximum pressure in the shell never exceeds the test pressure of the shell.

212 536 (cont'd) (4) For shells with an insulation consisting of a complete cladding intended for the carriage of substances referred to in 212 511, the capacity and setting of the pressure-relief device(s) shall be determined assuming a loss of insulation from 1% of the surface area.

(5) Vacuum-relief devices and spring-loaded safety valves of shells for the carriage of substances referred to in 212 511 shall be provided with flame arresters unless the substances to be carried and their decomposition products are non-combustible. Due attention shall be paid to the reduction of the relief capacity caused by the flame arrester.

212 537-
212 539

Section 4: Type approval

212 540 Tank-containers approved for the carriage of ammonium nitrate liquid of marginal 2501, 20°, shall not be approved for the carriage of other substances.

212 541 For the type approval of shells intended for the carriage of substances referred to in 212 511, tests shall be undertaken:

- to prove the compatibility of all materials normally in contact with the substance during carriage;

- to provide data to facilitate the design of the pressure relief devices and safety valves taking into account the design characteristics of the tank-container; and

- to establish any special requirements necessary for the safe carriage of the substance.

The test results shall be included in the report for the type approval of the shell.

212 542-
212 549

Section 5: Tests

212 550 Shells intended for the carriage of the substances referred to in 212 510 (a), (b) and (c) shall be subjected to the initial and periodic hydraulic pressure tests at a pressure of not less than 400 kPa (4 bar) (gauge pressure). Shells of pure aluminium intended for the carriage of substances of marginal 2501, 1°, may be subjected to the initial and periodic hydraulic pressure tests at a pressure of only 250 kPa (2.5 bar) (gauge pressure).

Shells intended for the carriage of the substances referred to in 212 510 (d) and (e) shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in 212 123.

212 551 Shells intended for the carriage of substances referred to in 212 511 shall be subjected to the initial and periodic hydraulic pressure tests at the calculation pressure in accordance with 212 524.

212 552-
212 559

Section 6: Marking

212 560 The following additional particulars shall be marked by stamping or by any other similar method on the plate prescribed in 212 161 or directly on the walls of the shell itself, if the walls are so reinforced that the strength of the shell is not impaired:

the chemical name with the approved concentration of the substance concerned.

212 561-
212 569

Section 7: Operation

212 570 The inside of the shell and all parts liable to come into contact with the substances referred to in marginals 212 510 and 212 511 shall be kept clean. No lubricant capable of combining dangerously with the substance carried shall be used for pumps, valves or other devices.

212 571 Shells intended for the carriage of substances of 1° (a), 2° (a) and 3° (a) of marginal 2501 shall be filled to not more than 95% of their capacity at a reference temperature of 15°C. Shells intended for the carriage of substances of marginal 2501, 20°, shall be filled to not more than 97% of their capacity, and the maximum temperature after filling shall not exceed 140°C. Shells approved for the carriage of ammonium nitrate liquid shall not be used for the carriage of other substances.

212 572 Shells intended for the carriage of substances referred to in 212 511 shall be filled as set out in the test report for the type approval of the tank but shall be filled to not more than 90% of their capacity. Shells shall be free from impurities at the time of filling.

212 573 Service equipment such as valves and external piping of shells intended for the carriage of substances referred to in 212 511 shall be emptied after filling or discharging of the tank.

212 574-
212 599

212 810 (c) Amend "55° and 61° to 66°" to read:

"55°, 61° and 63° to 66°".

212 822 Delete the 3rd subparagraph.

212 834 Delete the phrase "and of aqueous solutions of hydrogen peroxide of 62°".

212 851 In the second paragraph, delete "and of aqueous solutions of hydrogen peroxide of 62°"

212 910 Read:

"substances of 1°, 2° and 4°(c) of marginal 2901 may be carried in tank-containers.

NOTE: For the carriage in bulk of substances of 4° (c) of marginal 2901, see marginal 91 111."

212 920 Read:

"Shells intended for the carriage of substances of 1° and 4 (c) shall be designed in accordance with the requirements of Part 1 of this Appendix."

212 930 Read:

"Shells intended for the carriage of substances of 1° and 2° shall be capable of being hermetically closed (7). Shells intended for the carriage of substances of 4° (c) shall be equipped with a safety valve."

212 931 Amend the first sentence to read:

"If shells intended for the carriage of substances of 1° and 2° are fitted with safety valves, a bursting disc shall be placed before the valves."

212 951 Read:

"Shells intended for the carriage of substances of 1° and 4° (c) shall be subjected to the initial and periodic hydraulic pressure tests at their calculation pressure as defined in marginal 212 123."

212 970 Read:

"Shells intended for the carriage of substances of 1° and 2° shall be hermetically closed (7) during carriage."

APPENDIX B.1c

213 010 Paragraphs (d) and (e) are amended as follows:

"(d) Aqueous solutions of hydrogen peroxide of 1° (b) and (c) and solutions of 11° (b) of Class 5.1;

(e) Substances of 1° (b) and (c), 2° (b) and (c), solutions of hydrochloric acid of 5° (b), substances of 5° (c) and 9° (b), phosphoric acid of 11° (c) and substances of 42°, 43° (c) and 61°of Class 8."

213 100 Insert new (3), existing (3) becomes (4):

"(3) Special provisions applicable to tanks used for the carriage of substances of Class 5.1: marginal 211 532."

APPENDIX B.1d

214 250(1) Amend "Class 4.2, 3°", to read

"Class 4.2, 6°(a), 17°(a), 19°(a) and 31°(a) to 33°(a)".

APPENDIX B.2

220 000 Replace the text of paragraph (b)1 "Battery Master Switch", following the sentence "The switch shall be openable while the engine is running without causing a dangerous surge.", with the following:

"The battery master switch shall be fitted with contacts which are capable of achieving physical separation for isolation purposes in accordance with the requirements of European Standards EN 50 014 and EN 50 020. The tachograph and its electrical circuits and other equipment which remain energised when the battery master switch is opened shall be suitable for use in a hazardous area and shall meet the appropriate requirements of European Standards EN 50 014 and one of EN 50 015 to EN 50 020 or EN 50 028. In the case of EN 50 014 and EN 50 018 or EN 50 020, the requirements for the relevant gas group according to the product being carried shall be met. The electrical supply to the tachograph or other electrical equipment shall be provided via a safety barrier connected direct to the battery. The safety barrier shall meet the requirements of European Standards EN 50 014 and EN 50 020."

APPENDIX B.3

230 000 Amend paragraph (5) to read:

"The vehicle specified above has undergone the inspections prescribed in ADR, Annex B, marginals 10 282/10 283 */ and fulfils the conditions required for its acceptance for the international carriage of dangerous goods ....".

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*/ Delete if not applicable.

APPENDIX B.5

250 000 List of substances and identification numbers

(1) The hazard identification number consists of two or three figures. In general, the figures indicate the following hazards:

2	Emission of gas due to pressure or to chemical reaction
3	Flammability of liquids (vapours) and gases or self-heating liquid
4	Flammability of solids or self-heating solid
5	Oxidizing (fire-intensifying) effect
6	Toxicity
7	Radioactivity
8	Corrosivity
9	Risk of spontaneous violent reaction

Doubling of a figure indicates an intensification of that particular hazard.

Where the hazard associated with a substance can be adequately indicated by a single figure, this is followed by a zero.

The following combinations of figures, however, have a special meaning: 22, 323, 333, 362, x362, 382, x382, 423, 44, 462, 482, 539 and 90, see (2) below.

If a hazard identification number is prefixed by the letter "X", this indicates that the substance will react dangerously with water.

(2) The hazard identification numbers listed in paragraph (3) have the following meanings:

20	inert gas
22	refrigerated gas
223	refrigerated flammable gas
225	refrigerated oxidizing (fire-intensifying) gas
23	flammable gas
236	flammable gas, toxic
239	flammable gas, which can spontaneously lead to violent reaction
25	oxidizing (fire-intensifying) gas
26	toxic gas
265	toxic gas, oxidizing (fire-intensifying)
266	highly toxic gas
268	toxic gas, corrosive
286	corrosive gas, toxic
30	flammable liquid (flash-point from 21°C to 100°C) or self-heating liquid
323	flammable liquid which reacts with water, emitting flammable gases
X323	flammable liquid which reacts dangerously with water, emitting flammable gases*/
33	highly flammable liquid (flash-point below 21°C)
333	pyrophoric liquid
X333	pyrophoric liquid which reacts dangerously with water*/

*/ Water not to be used except by approval of the competent authority.

250 000 (cont'd)	336	highly flammable liquid, toxic
	338	highly flammable liquid, corrosive
	X338	highly flammable liquid, corrosive, which reacts dangerously with water*/
	339	highly flammable liquid which can spontaneously lead to violent reaction
	36	self-heating liquid, toxic
	362	flammable liquid, toxic, which reacts with water, emitting flammable gases
	X362	flammable liquid toxic, which reacts dangeroulsy with water, emitting flammable gases*/
	38	self-heating liquid, corrosive
	382	flammable liquid, corrosive, which reacts with water, emitting flammable gases
	X382	flammable liquid, corrosive, which reacts dangeroulsy with water, emitting flammable gases*/
	39	flammable liquid, which can spontaneously lead to violent reaction
	40	flammable or self-heating solid
	423	solid which reacts with water, emitting flammable gases
	X423	flammable solid which reacts dangerously with water, emitting flammable gases*/
	44	flammable solid, in the molten state at an elevated temperature
	446	flammable solid, toxic, in the molten state, at an elevated temperature
	46	flammable or self-heating solid, toxic
	462	toxic solid which reacts with water, emitting flammable gases
	48	flammable or self-heating solid, corrosive
	482	corrosive solid which reacts with water, emitting flammable gases
	50	oxidizing (fire-intensifying) substance
	539	flammable organic peroxide
	55	strongly oxidizing substance
	556	strongly oxidizing substance, toxic
	558	strongly oxidizing (fire-intensifying) substance, corrosive
	559	strongly oxidizing (fire-intensifying) substance, which can spontaneously lead to violent reaction
	56	oxidizing substance, toxic
	568	oxidizing substance, toxic, corrosive
	58	oxidizing substance, corrosive
	59	oxidizing substance which can spontaneously lead to violent reaction
	60	toxic or harmful substance
	63	toxic or harmful substance, flammable (flash-point between 21°C and 55°C)
	638	toxic or harmful substance, flammable (flash-point between 21°C and 55°C), corrosive
	639	toxic or harmful substance, flammable (flash-point between 21°C and 55°C) which can spontaneously lead to violent reaction
	66	highly toxic substance
	663	highly toxic substance, flammable (flash-point not above 55°C)
	68	toxic or harmful substance, corrosive
	69	toxic or harmful substance, which can spontaneously lead to violent reaction

*/ Water not to be used except by approval of the competent authority.

250 000 (cont'd)	70	radioactive material
	72	radioactive gas
	723	radioactive gas, flammable
	73	radioactive liquid, flammable (flash point not above 55°C)
	74	radioactive solid, flammable
	75	radioactive material, oxidizing
	76	radioactive material, toxic
	78	radioactive material, corrosive
	80	corrosive or slightly corrosive substance
	X80	corrosive or slightly corrosive substance, which reacts dangerously with water */
	83	corrosive or slightly corrosive substance, flammable (flash-point between 21°C and 55°C)
	X83	corrosive or slightly corrosive substance, flammable (flash-point between 21°C and 55°C), which reacts dangerously with water */
	839	corrosive or slightly corrosive substance, flammable (flash-point between 21°C and 55°C) which can spontaneously lead to violent reaction
	X839	corrosive or slightly corrosive substance, flammable (flash-point between 21°C and 55°C), which can spontaneously lead to violent reaction and which reacts dangerously with water */
	85	corrosive or slightly corrosive substance, oxidizing (fire-intensifying)
	856	corrosive or slightly corrosive substance, oxidizing (fire-intensifying) and toxic
	86	corrosive or slightly corrosive substance, toxic
	88	highly corrosive substance
	X88	highly corrosive substance, which reacts dangerously with water */
	883	highly corrosive substance, flammable (flash-point between 21°C and 55°C)
	885	highly corrosive substance, oxidizing (fire-intensifying)
	886	highly corrosive substance, toxic
	X886	highly corrosive substance, toxic, which reacts dangerously with water */
	89	corrosive or slightly corrosive substance, which can spontaneously lead to violent reaction
	90	miscellaneous dangerous substance

(3) The identification numbers referred to in marginal 10 500 are listed in tables I and II below.

NOTE 1: The identification numbers to be shown on the orange plates should be looked for first in table I. If in the case of substances of Classes 3, 6.1, 7 and 8 the name of the substance to be carried or the collective heading which covers it is not listed in table I, the identification numbers are to be taken from table II.

NOTE 2: The danger labels prescribed under marginal 10 500 (8) to (11) take precedence over the labelling indicated in column (e) of tables I and II.

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*/ Water not to be used except by approval of the competent authority.

250 000
(cont'd)

Table I

List of substances described under their chemical names or under collective headings which are given a specific "substance identification number" [column (d)]. [For solutions and mixtures of substances (such as preparations and wastes), see also marginal 2002 (8) and (9)].

This table also includes substances not shown in the class lists of substances, but which nevertheless fall within the classes and item numbers shown in column (b).

NOTE: For substances of Classes 3, 4.1, 4.2, 4.3, 5.1, 6.1, 7 and 8 not mentioned in this table, see table II. Substances are listed in alphabetical order.

The sign "-" in column (e) means: No label prescribed.

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Acetal (1,1-Diethoxyethane)	3, 3°(b)	33	1088	3
Acetaldehyde (Aldehyde)	3, 1°(a)	33	1089	3
Acetaldehyde oxime	3, 31°(c)	30	2332	3
Acetic acid, glacial and aqueous solutions of acetic acid with more than 80% pure acid	8, 32°(b)	83	2789	8 + 3
Acetic acid with from 50 to 80% pure acid	8, 32°(c)	80	2790	8
Acetic anhydride	8, 32°(b)	83	1715	8 + 3
Acetoin (Acetylmethylcarbinol)	3, 31°(c)	30	2621	3
Acetone	3, 3°(b)	33	1090	3
Acetone cyanohydrin	6.1, 11°(a)	66	1541	6.1
Acetonitrile	3, 11°(b)	336	1648	3 + 6.1
Acetyl acetone: see Pentan-2,4-dione				
Acetyl bromide	8, 36°(b)	80	1716	8
Acetyl chloride	3, 25°(b)	X338	1717	3 + 8
Acetyl iodide	8, 36°(b)	80	1898	8
Acetylene tetrabromide: see 1,1,2,2-Tetrabromoethane				
Acetylene tetrachloride: see 1,1,2,2-Tetrachloroethane				
Acetylmethylcarbinol: see Acetoin				
Acrolein	3, 17°(a)	336	1092	3 + 6.1
Acrolein dimer	3, 31°(c)	39	2607	3
Acrylamide	6.1, 12°(c)	60	2074	6.1A
Acrylamide, solutions of	6.1, 12°(c)	60	2074	6.1A
Acrylic acid	8, 32°(b)	89	2218	8 + 3
Acrylonitrile	3, 11°(a)	336	1093	3 + 6.1
Actinolite: see White asbestos				
Adhesives				
- with a flash-point below 21°C	3, 5°	33	1133	3
- with a flash-point between 21°C and 55°C	3, 31°(c)*/	30	1133	3
- with a flash-point above 55°C	3, 32°(c)*/	30	1133	-

*/ See, however, NOTE under section D of marginal 2301.

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Adiponitrile	6.1, 12°(c)	60	2205	6.1A
Air, liquid, deeply-refrigerated	2, 8°(a)	225	1003	2 +05
Aldehyde: see Acetaldehyde				
Aldol (beta-Hydroxybutyraldehyde)	6.1, 13°(b)	60	2839	6.1
Alkali metal amalgams	4.3, 11°(a)	X423	1389	4.3
Alkali metal amides	4.3, 19°(b)	423	1390	4.3
Alkali metal dispersions	4.3, 11°(a)	X423	1391	4.3
Alkaline-earth metal amalgams	4.3, 11°(a)	X423	1392	4.3
Alkaline-earth metal dispersions	4.3, 11°(a)	X423	1391	4.3
Allyl acetate	3, 17°(b)	336	2333	3 + 6.1
Allyl Alcohol	6.1, 13°(a)	663	1098	6.1 + 3
Allylamine	3, 15°(a)	336	2334	3 + 6.1
Allyl bromide	3, 16°(a)	336	1099	3 + 6.1
Allyl chloride	3, 16°(a)	336	1100	3 + 6.1
Allyl chloroformate	8, 64°(a)	88	1722	8
Allyl ethyl ether	3, 17°(b)	336	2335	3 + 6.1
Allyl formate	3, 17°(a)	336	2336	3 + 6.1
Allyl glycidyl ether (1-Allyloxy-2,3-epoxypropane)	3, 31°(c)	30	2219	3
Allyl iodide	3, 25°(a)	338	1723	3 + 8
Allyl isothiocyanate	6.1, 20°(b)	69	1545	6.1 + 3
1-Allyloxy-2, 3-epoxypropane: see Allyl glycidyl ether				
Allyl trichlorosilane	8, 37°(b)	X839	1724	8 + 3
Aluminium alkyl halides	4.2, 32°(a)	X333	3052	4.2 +4.3
Aluminium alkyl hydrides	4.2, 32°(a)	X333	3076	4.2 +4.3
Aluminium alkyls	4.2, 31°(a)	X333	3051	4.2 +4.3
Aluminium borohydride	4.2, 17°(a)	X333	2870	4.2 +4.3
Aluminium bromide, anhydrous	8, 22°(b)	80	1725	8
Aluminium bromide, aqueous solutions of	8, 5°(c)	80	2580	8
Aluminium carbide	4.3, 17°(b)	423	1394	4.3
Aluminium chloride, anhydrous	8, 22°(b)	80	1726	8
Aluminium chloride, aqueous solutions of	8, 5°(c)	80	2581	8
Aluminium dross	4.3, 13°(b) 4.3, 13°(c)	423 423	3170 3170	4.3 4.3
Aluminium ferrosilicon powder	4.3, 15°(b)	462	1395	4.3 +6.1
Aluminium nitrate	5.1, 22°(c)	50	1438	5.1
Aluminium powder, coated	4.1, 13°(b) 4.1, 13°(c)	40 40	1309 1309	4.1 4.1
Aluminium powder, uncoated	4.3, 13°(b)	423	1396	4.3
Aluminium resinate	4.1, 12°(c)	40	2715	4.1
Aluminium silicon powder, uncoated	4.3, 13°(c)	423	1398	4.3
2-Amino-5-diethylaminopentane	6.1, 12°(c)	60	2946	6.1A
2-(2-Aminoethoxy) ethanol	8, 54°(c)	80	3055	8
N-Aminoethylpiperazine	8, 53°(c)	80	2815	8
Aminophenols	6.1, 12°(c)	60	2512	6.1A
Ammonia	2, 3°(at)	268	1005	6.1

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Ammonia dissolved in water with more than 40% but not more than 50% ammonia by mass	2, 9°(at)	268	2073	6.1
Ammonia dissolved in water with more than 35% but not more than 40% ammonia (NH_3) by mass	2, 9°(at)	268	2073	6.1
Ammonia solutions with not less than 10% and not more than 35% ammonia	8, 43°(c)	80	2672	8
Ammonium bifluoride	8, 26°(b)	80	1727	8 + 6.1
Ammonium bifluoride, solutions of	8, 26°(b)	80	2817	8 + 6.1
Ammonium bisulphate with 3% or more free sulphuric acid	8, 23°(b)	80	2506	8
Ammonium dichromate	5.1, 27°(b)	50	1439	5.1
Ammonium fluoride	6.1, 65°(c)	60	2505	6.1A
Ammonium nitrate	5.1, 21°(c)	50	1942	5.1
Ammonium nitrate fertilizers,				
- type A1	5.1, 21°(c)	50	2067	5.1
- type A2	5.1, 21°(c)	50	2068	5.1
- type A3	5.1, 21°(c)	50	2069	5.1
- type A4	5.1, 21°(c)	50	2070	5.1
Ammonium nitrate liquid, hot concentrated solution	5.1, 20°	59	2426	5.1
Ammonium persulphate	5.1, 18°(c)	50	1444	5.1
Ammonium polysulphide, solutions of	8, 45°(b)	86	2818	8
Ammonium silicofluoride	6.1, 66°(c)	60	2854	6.1A
Ammonium sulphide, solutions of	8, 45°(b)	86	2683	8
Amosite: see Brown asbestos				
Amyl acetates	3, 31°(c)	30	1104	3
Amyl acid phosphate	8, 38°(c)	80	2819	8
n-Amyl alcohol	3, 31°(c)	30	1105	3
sec-Amyl alcohol	3, 31°(c)	30	1105	3
Amyl alcohol, tertiary	3, 3°(b)	33	1105	3
n-Amylamine	3, 22°(b)	338	1106	3 + 8
Amyl butyrates	3, 31°(c)	30	2620	3
Amyl chloride	3, 3°(b)	33	1107	3
Amylene, normal (1-Pentene)	3, 1°(a)	33	1108	3
Amyl mercaptan	3, 3°(b)	33	1111	3
Amyl methyl ketone	3, 31°(c)	30	1110	3
Amyl nitrate	3, 31°(c)	30	1112	3
Amyl nitrite	3, 3°(b)	33	1113	3
Amyltrichlorosilane	8, 37°(b)	X80	1728	8
Aniline	6.1, 11°(b)	60	1547	6.1
Anisidines	6.1, 12°(c)	60	2431	6.1A
Anisole: see Phenyl methyl ether				
Anisoyl chloride	8, 35°(b)	80	1729	8
Anthophyllite: see White absestos				
Antimony pentachloride ($SbCl_5$)	8, 21°(b)	80	1730	8
Antimony pentachloride, non aqueous solutions of	8, 21°(b)	80	1731	8
Antimony pentafluoride	8, 26°(b)	86	1732	8 + 6.1

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Antimony trichloride ($SbCl_3$)	8, 22°(b)	80	1733	8
Anthophyllite: see White asbestos				
Argon, liquid, deeply-refrigerated	2, 7°(a)	22	1951	2
Arsenic acid, liquid	6.1, 51°(a)	66	1553	6.1
Arsenic acid, solid	6.1, 51°(b)	60	1554	6.1
Arsenic bromide	6.1, 51°(b)	60	1555	6.1
Arsenic chloride	6.1, 51°(a)	66	1560	6.1
Arsenic pentoxide	6.1, 51°(b)	60	1559	6.1
Arsenic trioxide (White arsenic)	6.1, 51°(b)	60	1561	6.1
Barium	4.3, 11°(b)	423	1400	4.3
Barium bromate	5.1, 29°(b)	56	2719	5.1+6.1
Barium carbonate	6.1, 60°(c)	60	1564	6.1A
Barium chlorate	5.1, 29°(b)	56	1445	5.1+6.1
Barium hypochlorite	5.1, 29°(b)	56	2741	5.1+6.1
Barium nitrate	5.1, 29°(b)	56	1446	5.1+6.1
Barium oxide	6.1, 60°(c)	60	1884	6.1A
Barium perchlorate	5.1, 29°(b)	56	1447	5.1+6.1
Barium permanganate	5.1, 29°(b)	56	1448	5.1+6.1
Barium peroxide	5.1, 29°(b)	56	1449	5.1+6.1
Benzene	3, 3°(b)	33	1114	3
Benzene sulphonyl chloride	8, 36°(c)	80	2225	8
Benzonitrile	6.1, 11°(b)	60	2224	6.1
Benzoquinone	6.1, 14°(b)	60	2587	6.1
Benzotrichloride (Trichloromethylbenzene)	8, 66°(b)	80	2226	8
Benzotrifluoride	3, 3°(b)	33	2338	3
Benzoyl chloride	8, 36°(b)	80	1736	8
Benzyl bromide	6.1, 15°(b)	60	1737	6.1
Benzyl chloride	6.1, 15°(b)	68	1738	6.1
Benzyl chloroformate	8, 64°(a)	88	1739	8
Benzyl cyanide (Phenylacetonitrile)	6.1, 12°(c)	60	2470	6.1A
Benzyl dimethylamine	8, 53°(b)	83	2619	8 + 3
Benzylidene chloride	6.1, 17°(b)	68	1886	6.1
Benzyl iodide	6.1, 17°(b)	60	2653	6.1
Beryllium nitrate	5.1, 29°(b)	56	2464	5.1+6.1
Bis-aminopropylamine (Dipropylenetriamine, 3,3'-Iminobispropylamine)	8, 53°(c)	80	2269	8
1,2-Bis(dimethylamino)ethane (Tetramethylethylenediamine)	3, 31°(c)	30	2372	3
Bisulphites, inorganic, aqueous solutions of	8, 27°(c)	80	2693	8
Blue asbestos (Crocidolite)	9, 1°(b)	90	2212	9
Borneol	4.1, 6°(c)	40	1312	4.1
Boron tribromide (Boron bromide) (BBr_3)	8, 21°(a)	X88	2692	8
Boron trifluoride acetic acid complex	8, 33°(b)	80	1742	8
Boron trifluoride dimethyletherate	4.3, 2°(a)	382	2965	4.3+3.8
Boron trifluoride ether complex	8, 33°(b)	83	2604	8 + 3

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Boron trifluoride propionic acid complex	8, 33°(b)	80	1743	8
Boron trifluoride dihydrate	8, 33°(b)	80	2851	8
Bromine	8, 24°	886	1744	8 + 6.1
Bromine pentafluoride	5.1, 5°	568	1745	5.1+6.1+8
Bromine trifluoride	5.1, 5°	568	1746	5.1+6.1+8
Bromoacetic acid	8, 31°(b)	80	1938	8
Bromoacetone	6.1, 16°(b)	60	1569	6.1
omega-Bromoacetophenone: see Phenacyl bromide				
Bromoacetyl bromide	8, 36°(b)	X80	2513	8
Bromobenzene	3, 31°(c)	30	2514	3
alpha-Bromobenzyl cyanide	6.1, 17°(a)	66	1694	6.1
2-Bromobutane	3, 3°(b)	33	2339	3
Bromochlorodifluoromethane (R 12B1)	2, 3°(a)	20	1974	2
Bromochloromethane	6.1, 15(c)	60	1887	6.1A
1-Bromo-3-chloropropane	6.1, 15°(c)	60	2688	6.1A
2-Bromoethyl ethyl ether	3, 3°(b)	33	2340	3
Bromoform	6.1, 15°(c)	60	2515	6.1A
1-Bromo-3-methylbutane	3, 31°(c)	30	2341	3
Bromomethylpropanes	3, 3°(b)	33	2342	3
2-Bromopentane	3, 3°(b)	33	2343	3
2-Bromopropane	3, 3°(b)	33	2344	3
3-Bromopropyne	3, 3°(b)	33	2345	3
Bromotrifluoromethane (R 13B1)	2, 5°(a)	20	1009	2
Brown asbestos (Amosite or mysorite)	9, 1°(b)	90	2212	9
Butadienes	2, 3°(c)	239	1010	3
Butane, mixture of gases: see Mixture of hydrocarbons (liquefied gas) (Mixtures A, A0)				
Butane, technically pure	2, 3°(b)	23	1011	3
Butanedione (Diacetyl)	3, 3°(b)	33	2346	3
Butanol: see n-Butyl alcohol				
n-Butanol-2: see sec-Butyl alcohol				
Butanol, tertiary (tertiary Butyl alcohol)	3, 3°(b)	33	1120	3
1-Butene: see 1-Butylene				
cis-2-Butene: see cis-2-Butylene				
trans-2-Butene: see trans-2-Butylene				
Butoxyl (Methoxybutyl acetate)	3, 31°(c)	30	2708	3
n-Butyl acetate	3, 31°(c)	30	1123	3
Butyl acetate, secondary	3, 3°(b)	33	1123	3
Butyl acid phosphate	8, 38°(c)	80	1718	8
n-Butyl acrylate	3, 31°(c)	39	2348	3
n-Butyl alcohol (Butanol)	3, 31°(c)	30	1120	3
sec-Butyl alcohol (n-Butanol-2)	3, 31°(c)	30	1120	3
Butyl alcohol, tertiary: see Butanol, tertiary				

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
n-Butylamine	3, 22°(b)	338	1125	3 + 8
N-Butylanilines	6.1, 12°(b)	60	2738	6.1
Butyl benzenes	3, 31°(c)	30	2709	3
Butyl bromide, normal	3, 3°(b)	33	1126	3
Butyl chlorides (Chlorobutanes)	3, 3°(b)	33	1127	3
n-Butylchloroformate	6.1, 16°(b)	638	2743	6.1 + 3 + 8
tert-Butylcyclohexylchloroformate	6.1, 17°(c)	68	2747	6.1A + 8
1-Butylene (1-Butene)	2, 3°(b)	23	1012	3
cis-2-Butylene (cis-2-Butene)	2, 3°(b)	23	1012	3
trans-2-Butylene (trans-2-Butene)	2, 3°(b)	23	1012	3
1,2-Butylene oxide	3, 3°(b)	339	3022	3
n-Butyl ether: see Di-n-butyl ether				
n-Butyl formate	3, 3°(b)	33	1128	3
N, n-Butyl imidazole	6.1, 12°(b)	60	2690	6.1
Butyl isocyanate, normal	3, 14°(b)	336	2485	3 + 6.1
Butyl isocyanate, tertiary	3, 14°(a)	336	2484	3 + 6.1
Butyl mercaptan	3, 3°(b)	33	2347	3
n-Butyl methacrylate	3, 31°(c)	39	2227	3
Butyl methyl ether	3, 3°(b)	33	2350	3
Butyl nitrites	3, 3°(b)	33	2351	3
Butylphenols, in the molten state	6.1, 14°(c)	60	2229	6.1A
Butylphenols, liquid	6.1, 14°(c)	60	2228	6.1A
Butyl propionate	3, 31°(c)	30	1914	3
Butyl toluenes	3, 32°(c)	30	2667	-
Butyltrichlorosilane	8, 37°(b)	X83	1747	8 + 3
Butyl vinyl ether	3, 3°(b)	339	2352	3
2-Butyne: see Crotonylene				
Butyraldehyde	3, 3°(b)	33	1129	3
Butyraldoxime	3, 32°(c)	30	2840	-
n-Butyric acid	8, 32°(c)	80	2820	8
Butyric anhydride	8, 32°(c)	80	2739	8
Butyronitrile	3, 11°(b)	336	2411	3 + 6.1
Butyryl chloride	3, 25°(b)	338	2353	3 + 8
Caesium	4.3, 11°(a)	X423	1407	4.3
Caesium hydroxide	8, 41°(b)	80	2682	8
Caesium hydroxide, aqueous solutions of	8, 42°(b)	80	2681	8
Caesium nitrate	5.1, 22°(c)	50	1451	5.1
Calcium	4.3, 11°(b)	423	1401	4.3
Calcium arsenate	6.1, 51°(b)	60	1573	6.1
Calcium carbide	4.3, 17°(b)	423	1402	4.3
Calcium chlorate	5.1, 11°(b)	50	1452	5.1
Calcium chlorate, aqueous solution	5.1, 11°(b)	50	2429	5.1
Calcium chlorite	5.1, 14°(b)	50	1453	5.1

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Calcium cyanamide	4.3, 19°(c)	423	1403	4.3
Calcium dithionite	4.2, 13°(b)	40	1923	4.2
Calcium hypochlorite mixtures, dry	5.1, 15°(c)	50	2208	5.1
Calcium hypochlorite				
- dry	5.1, 15°(b)	50	1748	5.1
- mixtures	5.1, 15°(b)	50	1748	5.1
Calcium hypochlorite				
- hydrated	5.1, 15°(b)	50	2880	5.1
- hydrated mixtures	5.1, 15°(b)	50	2880	5.1
Calcium manganese silicon	4.3, 12°(c)	423	2844	4.3
Calcium nitrate	5.1, 22°(c)	50	1454	5.1
Calcium perchlorate	5.1, 13°(b)	50	1455	5.1
Calcium permanganate	5.1, 17°(b)	50	1456	5.1
Calcium peroxide	5.1, 25°(b)	50	1457	5.1
Calcium silicide	4.3, 12°(b)	423	1405	4.3
Calcium silicide	4.3, 12°(c)	423	1405	4.3
Calcium resinate	4.1, 12°(c)	40	1313	4.1
Calcium resinate, fused	4.1, 12°(c)	40	1314	4.1
Camphor	4.1, 6°(c)	40	2717	4.1
Camphor oil	3, 31°(c)	30	1130	3
Caproic acid	8, 32°(c)	80	2829	8
Carbon or carbon black	4.2, 1°(b)	40	1361	4.2
	4.2, 1°(c)	40	1361	4.2
Carbon activated	4.2, 1°(c)	40	1362	4.2
Carbon dioxide	2, 5°(a)	20	1013	2
Carbon dioxide, liquid, deeply-refrigerated	2, 7°(a)	22	2187	2
Carbon dioxide with not more than 6% ethylene oxide by mass	2, 6°(c)	239	1952	3
Carbon dioxide with more than 6% but not more than 35% ethylene oxide by mass	2, 6°(c)	239	1041	3
Carbon dioxide with not less than 1% and not more than 10% oxygen by mass	2, 6°(a)	20	1014	2
Carbon disulphide	3, 18°(a)	336	1131	3 + 6.1
Carbon tetrabromide	6.1, 15°(c)	60	2516	6.1A
Carbon tetrachloride	6.1, 15°(b)	60	1846	6.1
Caustic potash: see Potassium hydroxide				
Caustic soda: see Sodium hydroxide				
Cerium	4.3, 13°(b)	423	3078	4.3
Chloral: see Trichloroacetaldehyde				
Chlorate and borate mixtures	5.1, 11°(b)	50	1458	5.1
Chlorate and magnesium chloride mixtures	5.1, 11°(b)	50	1459	5.1
Chloric acid, aqueous solution	5.1, 4°(b)	50	2626	5.1
Chlorine	2, 3°(at)	266	1017	6.1+ 8
Chloroacetaldehyde	6.1, 16°(b)	60	2232	6.1
Chloroacetic acid (Monochloroacetic acid), solid	8, 31°(b)	80	1751	8
Chloroacetic acid (Monochloroacetic acid), in the molten state	8, 31°(b)	80	1750	8
Chloroacetic acids, mixtures of	8, 32°(b)	80	1750	8

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Chloroacetic acid (Monochloroacetic acid), solutions of	8, 32°(b)	80	1750	8
Chloroacetone	6.1, 16°(b)	60	1695	6.1
omega-Chloroacetophenone: see Phenacyl chloride				
Chloroacetyl chloride	8, 36°(b)	X80	1752	8
Chloroanisidines	6.1, 17°(c)	60	2233	6.1A
Chlorobenzene (Phenyl chloride)	3, 31°(c)	30	1134	3
Chlorobenzotrifluorides	3, 31°(c)	30	2234	3
Chlorobenzyl chlorides	6.1, 17°(c)	60	2235	6.1A
Chlorobutanes: see Butyl chlorides				
Chlorocresols	6.1, 14°(b)	60	2669	6.1
1-Chloro-1,1-difluoroethane (R 142b)	2, 3°(b)	23	2517	3
Chlorodifluoromethane (R 22)	2, 3°(a)	20	1018	2
Chlorodinitrobenzene	6.1, 12°(b)	60	1577	6.1
2-Chloroethanol: see Ethylene chlorohydrin				
Chloroform	6.1, 15°(b)	60	1888	6.1
Chloromethylchloroformate	6.1, 16°(b)	638	2745	6.1 + 3 + 8
Chloromethyl ethyl ether	3, 16°(b)	336	2354	3 + 6.1
3-Chloro-4-methylphenyl isocyanate	6.1, 19°(b)	60	2236	6.1
Chloronitroanilines	6.1, 17°(c)	60	2237	6.1A
Chloronitrobenzenes	6.1, 12°(b)	60	1578	6.1
Chloronitrotoluenes	6.1, 17°(c)	60	2433	6.1A
Chloropentafluoroethane (R 115)	2, 3°(a)	20	1020	2
2-Chlorophenol	6.1, 16°(c)	68	2021	6.1A
3-Chlorophenol	6.1, 17°(c)	60	2020	6.1A
4-Chlorophenol	6.1, 17°(c)	60	2020	6.1A
Chlorophenyltrichlorosilane	8, 37°(b)	X80	1753	8
Chloropicrin	6.1, 16°(a)	66	1580	6.1
Chloroprene	3, 16°(a)	336	1991	3 + 6.1
1-Chloropropane (Propyl chloride)	3, 2°(b)	33	1278	3
2-Chloropropane (Isopropyl chloride)	3, 2°(b)	33	2356	3
3-Chloropropane-1,2-diol: see Glycerol alpha-monochlorohydrin				
3-Chloro-1-propanol	6.1, 16°(c)	60	2849	6.1A
1-Chloro-2-propanol	6.1, 16°(b)	63	2611	6.1 + 3
2-Chloropropene	3, 1°(a)	33	2456	3
2-Chloropropionic acid	8, 32°(c)	80	2511	8
2-Chloropyridine	6.1, 11°(b)	60	2822	6.1
Chlorosulphonic acid ($SO_2(OH)Cl$)	8, 21°(a)	88	1754	8
1-Chloro-1,2,2,2-tetrafluoroethane (R124)	2, 3°(a)	20	1021	2
Chlorotoluenes	3, 31°(c)	30	2238	3
Chlorotoluidines	6.1, 17°(c)	60	2239	6.1A
1-Chloro-2,2,2-trifluoroethane (R 133a)	2, 3°(a)	20	1983	2
Chlorotrifluoromethane (R 13)	2, 5°(a)	20	1022	2
Chromic acid, solutions of	8, 11°(b)	80	1755	8

Name of substance (a)	Class and item number (b)	Hazard identification No. (upper part) (c)	Substance identification No. (lower part) (d)	Label (e)
Chromic fluoride	8, 26°(b)	80	1756	8 + 6.1
Chromic fluoride, solutions of	8, 26°(b)	80	1757	8 + 6.1
Chromium nitrate	5.1, 22°(c)	50	2720	5.1
Chromium oxychloride: see Chromyl chloride				
Chromium trioxide, anhydrous	5.1, 31°(b)	58	1463	5.1+8
Chromosulphuric acid	8, 1°(a)	88	2240	8
Chromyl chloride (Chromium oxychloride) (CrO_2Cl_2)	8, 21°(a)	88	1758	8
Chrysotile: see White asbestos				
Coating solution				
– with a flash-point below 21°C	3, 3°(b)	33	1139	3
– with a flash-point between 21°C and 55°C	3, 31°(c)	30	1139	3
– with a flash-point above 55°C	3, 32°(c)	30	1139	–
Cobalt naphtenate powder	4.1, 12°(c)	40	2001	4.1
Cobalt resinate	4.1, 12°(c)	40	1318	4.1
Collodions, semi-collodions, solutions of, and other nitrocellulose solutions, with 20% or less nitrocellulose:				
– having a flash-point below 21°C	3, 5°	33	1263	3
– having a flash-point between 21°C and 55°C (limit values included)	3, 33°(c)*/	30	1263	3
– having a flash-point above 55°C	3, 34°(c)*/	30	1263	–
Collodions, semi-collodions, solutions of, and other nitrocellulose solutions, with more than 20 % but not more than 55 % nitrocellulose				
– having a flash-point below 21°C and a boiling point not more than 35°C	3, 4°(a)	33	2060	3
– having a flash-point below 21°C and a boiling point higher than 35°C	3, 4°(b)	33	2060	3
– having a flash-point between 21°C and 55°C (limit values included)	3, 33°(c)	30	2060	3
– having a flash-point above 55°C	3, 34°(c)	30	2060	–
Copper chlorate	5.1, 11°(b)	50	2721	5.1
Cresols	6.1, 14°(b)	60	2076	6.1
Cresylic acid	6.1, 14°(b)	60	2022	6.1
Crocidolite: see Blue asbestos				
Crotonic aldehyde (Crotonaldehyde)	3, 3°(b)	33	1143	3
Crotonylene (2-Butyne)	3, 1°(a)	339	1144	3
Cumene (Isopropylbenene)	3, 31°(c)	30	1918	3
Cyanuric chloride	8, 27°(c)	80	2670	8
Cyclobutyl chloroformate	6.1, 16°(b)	638	2744	6.1 + 3 + 8
1,5,9-Cyclododecatriene	6.1, 24°(c)	60	2518	6.1A
Cycloheptane	3, 3°(b)	33	2241	3
Cycloheptatriene	3, 20°(b)	336	2603	3 + 6.1
Cycloheptene	3, 3°(b)	33	2242	3
Cyclohexane	3, 3°(b)	33	1145	3
Cyclohexanone	3, 31°(c)	30	1915	3
Cyclohexene	3, 3°(b)	33	2256	3

*/ See, however, NOTE under section 0 of marginal 2301.

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Cyclohexenyltrichlorosilane	8, 37°(b)	X80	1762	8
Cyclohexyl acetate	3, 32°(c)	30	2243	-
Cyclohexylamine	8, 53°(b)	83	2357	8 + 3
Cyclohexyl isocyanate	6.1, 18°(b)	63	2488	6.1 + 3
Cyclohexyl mercaptan	3, 31°(c)	30	3054	3
Cyclohexyltrichlorosilane	8, 37°(b)	X80	1763	8
Cyclooctadiene	3, 31°(c)	30	2520	3
Cyclooctadiene phosphines: see 9-Phosphabicyclononanes				
Cyclooctatetraene	3, 31°(c)	30	2358	3
Cyclopentane	3, 3°(b)	33	1146	3
Cyclopentanol	3, 31°(c)	30	2244	3
Cyclopentanone	3, 31°(c)	30	2245	3
Cyclopentene	3, 2°(b)	33	2246	3
Cyclopropane	2, 3°(b)	23	1027	3
Cymenes (Methyl isopropyl benzenes)	3, 31°(c)	30	2046	3
Decaborane	4.1, 16°(b)	46	1868	4.1+6.1
Decahydronaphthalene (Decalin)	3, 32°(c)	30	1147	-
n-Decane	3, 31°(c)	30	2247	3
Diacetone alcohol, chemically pure	3, 31°(c)	30	1148	3
Diacetone alcohol, technical	3, 3°(b)	33	1148	3
Diacetyl: see Butanedione				
Diallylamine	3, 22°(b)	338	2359	3 + 8
Diallyl ether	3, 17°(b)	336	2360	3 + 6.1
Diaminodiphenyl methane, in the molten state	6.1, 12°(c)	60	2651	6.1A
Di-n-amylamine	6.1, 12°(c)	60	2841	6.1A
Dibenzyldichlorosilane	8, 37°(b)	X80	2434	8
Dibromobenzenes	3, 32°(c)	30	2711	-
1,2-Dibromobutan-3-one	6.1, 16°(b)	60	2648	6.1
1,2-Dibromo-3-chloropropane	6.1, 15°(c)	60	2872	6.1A
sym.-Dibromoethane: see Ethylene dibromide				
Dibromomethane: see Methylene bromide				
Di-(n-butyl) amine	8, 53°(b)	83	2248	8 + 3
Dibutylaminoethanol	6.1, 12°(c)	60	2873	6.1A
Di-n-butyl ether (n-Butyl ether)	3, 31°(c)	30	1149	3
Dichloroacetic acid	8, 32°(b)	80	1764	8
sym.-Dichloroacetone	6.1, 16°(b)	63	2649	6.1 + 3
Dichloroacetyl chloride	8, 36°(b)	X80	1765	8
Dichloroanilines	6.1, 12°(b)	60	1590	6.1
1,2-Dichlorobenzene	6.1, 15°(c)	60	1591	6.1A
2,2'-Dichlorodiethyl ether	6.1, 16°(b)	63	1916	6.1 + 3
Dichlorodifluoromethane (R 12)	2, 3°(a)	20	1028	2
Dichlorodifluoromethane and ethylene oxide mixtures with not more than 12% ethylene oxide by mass	2, 3°(a)	20	1028	2
	2, 4° at)	26	3070	6.1
Dichlorodifluoromethane with 12% of ethylene oxide by mass	2, 4°(ct)	236	1028	
1,1-Dichloroethane (Ethylidene chloride)	3, 3°(b)	33	2362	3
1,2-Dichloroethane (Ethylene dichloride)	3, 16°(b)	336	1184	3 + 6.1

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
1,2-Dichloroethylene	3, 3°(b)	33	1150	3
Dichlorofluoromethane (R 21)	2, 3°(a)	20	1029	2
1,3-Dichlorohydrin (1,3-Dichloro-2-propanol)	6.1, 16°(b)	60	2750	6.1
Dichloroisocyanuric acid, dry	5.1, 26°(b)	50	2465	5.1
Dichloroisocyanuric acid salts	5.1, 26°(b)	50	2465	5.1
Dichloroisopropyl ether	6.1, 16°(b)	60	2490	6.1
Dichloromethane: see Methylene chloride				
1,1-Dichloro-1-nitroethane	6.1, 16°(b)	60	2650	6.1
Dichloropentanes	3, 31°(c)	30	1152	3
Dichlorophenols	6.1, 17°(c)	60	2021	6.1A
3,4-Dichlorophenyl isocyanate	6.1, 19°(b)	60	2250	6.1
Dichlorophenyltrichlorosilane	8, 37°(b)	X80	1766	8
1,3-Dichloro-2-propanol: see 1,3-Dichlorohydrin				
1,3-Dichloropropene	3, 31°(c)	30	2047	3
1,2-Dichloro-1,1,2,2-tetrafluoroethane (R 114)	2, 3°(a)	20	1958	2
Dicycloheptadiene : see 2,5-Norbornadiene				
Dicyclohexylamine	8, 53°(c)	80	2565	8
Dicyclopentadiene	3, 31°(c)	30	2048	3
Didymium nitrate	5.1, 22°(c)	50	1465	5.1
Diesel oil: see Hydrocarbons, liquid				
1,1-Diethoxyethane: see Acetal				
1,2-Diethoxyethane (Ethylene glycol diethyl ether)	3, 31°(c)	30	1153	3
Diethoxymethane	3, 3°(b)	33	2373	3
3,3-Diethoxypropene	3, 3°(b)	33	2374	3
Diethylamine	3, 22°(b)	338	1154	3 + 8
Diethylaminoethanol (N, N-Diethylethanolamine)	3, 32°(c)	30	2686	-
Diethylaminopropylamine	8, 53°(c)	80	2684	8
N,N-Diethylaniline	6.1, 12°(c)	60	2432	6.1A
Diethylbenzenes	3, 32°(c)	30	2049	-
Diethyl carbonate (Ethyl carbonate)	3, 31°(c)	30	2366	3
Diethyldichlorosilane	8, 37°(b)	X83	1767	8 + 3
Diethylenediamine (Piperazine)	8, 52°(c)	80	2579	8
Diethylenetriamine	8, 53°(b)	80	2079	8
N,N-Diethylethanolamine: see Diethylaminoethanol				
N,N-Diethylethylenediamine	8, 53°(b)	83	2685	8 + 3
Diethyl ketone	3, 3°(b)	33	1156	3
Diethyl sulphate	6.1, 14°(b)	60	1594	6.1
Diethylthiophosphoryl chloride	8, 36°(b)	80	2751	8
Diethylzinc	4.2, 31°(a)	X333	1366	4.2 + 4.3
1,1-Difluoroethane (R 152a)	2, 3°(b)	23	1030	3
1,1-Difluoroethylene (Vinylidene fluoride)	2, 5°(c)	239	1959	3
Difluorophosphoric acid, anhydrous	8, 10°(b)	80	1768	8
2,3-Dihydropyran	3, 3°(b)	33	2376	3
Diisobutylamine	3, 31°(c)	30	2361	3
Diisobutylenes	3, 3°(b)	33	2050	3

Name of substance (a)	Class and item number (b)	Hazard identification No. (upper part) (c)	Substance identification No. (lower part) (d)	Label (e)
Diisobutyl ketone	3, 31°(c)	30	1157	3
Diisooctyl acid phosphate	8, 38°(c)	80	1902	8
Diisopropylamine	3, 22°(b)	338	1158	3 + 8
Diisopropyl ether	3, 3°(b)	33	1159	3
Diketene	3, 31°(c)	39	2521	3
1,1-Dimethoxyethane	3, 3°(b)	33	2377	3
1,2-Dimethoxyethane	3, 3°(b)	33	2252	3
Dimethoxymethane (Methylal)	3, 2°(b)	33	1234	3
Dimethylamine, anhydrous	2, 3°(bt)	236	1032	3 + 6.1
Dimethylamine, aqueous solutions of				
- having a boiling point not more than 35°C	3, 22°(a)	338	1160	3 + 8
- having a boiling point higher than 35°C	3, 22°(b)	338	1160	3 + 8
Dimethylaminoacetonitrile	6.1, 11°(b)	63	2378	6.1 + 3
Dimethylaminoethanol: see Dimethylethanolamine				
Dimethylaminoethyl methacrylate	6.1, 11°(b)	69	2522	6.1
N,N-Dimethylaniline	6.1, 11°(b)	60	2253	6.1
Dimethylbenzenes: see Xylenes.				
2, 3-Dimethylbutane	3, 3°(b)	33	2457	3
1,3-Dimethylbutylamine	3, 3°(b)	33	2379	3
N, N-Dimethylcarbamoyl chloride	8, 36°(b)	80	2262	8
Dimethyl carbonate	3, 3°(b)	33	1161	3
Dimethylcyclohexanes	3, 3°(b)	33	2263	3
N,N-Dimethylcyclohexylamine	8, 53°(b)	83	2264	8 + 3
Dimethyldichlorosilane	3, 21°(a)	X338	1162	3 + 8
Dimethyldiethoxysilane	3, 3°(b)	33	2380	3
Dimethyldioxanes				
- having a flash-point below 21°C	3, 3°(b)	33	2707	3
- having a flash-point between 21°C and 55°C (limit values included)	3, 31°(c)	30	2707	3
- having a flash-point above 55°C	3, 32°(c)	30	2707	-
Dimethyl disulphide	3, 3°(b)	33	2381	3
Dimethylethanolamine (Dimethylaminoethanol)	3, 31°(c)	30	2051	3
Dimethyl ether	2, 3°(b)	23	1033	3
N,N-Dimethylformamide	3, 32°(c)	30	2265	-
1,1-Dimethylhydrazine	3, 23°(a)	338	1163	3 + 8
1,2-Dimethylhydrazine	3, 15°(a)	336	2382	3 + 6.1
Dimethyl-N-propylamine	3, 22°(b)	338	2266	3 + 8
Dimethyl sulphate	6.1, 13°(a)	66	1595	6.1
Dimethyl sulphide	3, 2°(b)	33	1164	3
Dimethyl thiophosphoryl chloride	8, 36°(c)	80	2267	8
Dimethylzinc	4.2, 31°(a)	X333	1370	4.2 + 4.3
Dinitroanilines	6.1, 12°(b)	60	1596	6.1
Dinitrobenzenes	6.1, 12°(b)	60	1597	6.1
Dinitro-orthocresol	6.1, 75°(b)	60	1598	6.1
Dinitrotoluenes	6.1, 12°(b)	60	2038	6.1

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Dinitrotoluenes, molten	6.1, 12°(b)	60	1600	6.1
Dioxane	3, 3°(b)	33	1165	3
Dioxolane	3, 3°(b)	33	1166	3
Dipentene	3, 31°(c)	30	2052	3
Diphenyldichlorosilane	8, 37°(b)	X80	1769	8
4,4'-Diphenylmethane diisocyanate	6.1, 19°(c)	60	2489	6.1A
Diphenylmethyl bromide	8, 65°(b)	80	1770	8
Dipropylamine	3, 22°(b)	338	2383	3 + 8
Dipropylenetriamine: see Bis-aminopropylamine				
Dipropyl ether	3, 3°(b)	33	2384	3
Dipropyl ketone	3, 31°(c)	30	2710	3
Disulphur dichloride (S_2Cl_2)	8, 21°(a)	88	1828	8
Divinyl ether	3, 2°(b)	339	1167	3
Dodecyltrichlorosilane	8, 37°(b)	X80	1771	8
Dyes and intermediates				
- inorganic, corrosive	8, 46°(b)	80	2801	8
- inorganic, slighty corrosive	8, 46°(c)	80	2801	8
- organic, corrosive	8, 55°(b)	80	2801	8
- organic, slighty corrosive	8, 55°(c)	80	2801	8
Enamels				
- having a flash-point below 21°C	3, 5°	33	1263	3
- having a flash-point between 21°C and 55°C (limit values included)	3, 31°(c)*/	30	1263	3
- having a flash-point above 55°C	3, 32°(c)*/	30	1263	-
Epibromohydrin	6.1, 16°(a)	66	2558	6.1
Epichlorohydrin	6.1, 16°(b)	63	2023	6.1 + 3
1,2-Epoxy-3-ethoxypropane	3, 31°(c)	30	2752	3
Ethane	2, 5°(b)	23	1035	3
Ethane, liquid, deeply-refrigerated	2, 7°(b)	223	1961	3
Ethanol (Ethyl alcohol) and its aqueous solutions with more than 70% alcohol	3, 3°(b)	33	1170	3
Ethanol (Ethyl alcohol), aqueous solutions of, above 24% but not exceeding 70%	3, 31°(c)	30	1170	3
Ethanolamine and its solutions	8, 54°(c)	80	2491	8
2-Ethoxyethanol (Ethylene glycol monoethyl ether)	3, 31°(c)	30	1171	3
2-Ethoxyethyl acetate (Ethylene glycol monoethyl ether acetate)	3, 31°(c)	30	1172	3
Ethyl acetate	3, 3°(b)	33	1173	3
Ethyl acrylate	3, 3°(b)	339	1917	3
Ethyl alcohol: see Ethanol				
Ethylamine, anhydrous	2, 3°(bt)	236	1036	3 + 6.1
Ethylamine, aqueous solutions of				
- having a boiling point not more than 35°C	3, 22°(a)	338	2270	3 + 8
- having a boiling point higher than 35°C	3, 22°(b)	338	2270	3 + 8
Ethyl amyl ketone	3, 31°(c)	30	2271	3

*/ See however, NOTE under section 0 of marginal 2301.

Name of substance (a)	Class and item number (b)	Hazard identification No. (upper part) (c)	Substance identification No. (lower part) (d)	Label (e)
Ethyl-2-chloro propionate	3, 31°(c)	30	2935	3
2-Ethylaniline	6.1, 12°(c)	60	2273	6.1A
N-Ethylaniline	6.1, 12°(c)	60	2272	6.1A
Ethylbenzene, technical	3, 3°(b)	33	1175	3
N-Ethylbenzyltoluidines	6.1, 12°(c)	60	2753	6.1A
N-Ethyl-N-benzylaniline	6.1, 12°(c)	60	2274	6.1A
Ethyl bromide	6.1, 15°(b)	60	1891	6.1
Ethyl bromoacetate	6.1, 16°(b)	63	1603	6.1 + 3
2-Ethylbutanol	3, 32°(c)	30	2275	-
2-Ethylbutyl acetate	3, 31°(c)	30	1177	3
2-Ethylbutyraldehyde	3, 3°(b)	33	1178	3
Ethyl butyl ether	3, 3°(b)	33	1179	3
Ethyl butyrate	3, 31°(c)	30	1180	3
Ethyl carbonate: see Diethyl carbonate				
Ethyl chloride	2, 3°(bt)	236	1037	3+6.1
Ethyl chloroacetate	6.1, 16°(b)	63	1181	6.1 + 3
Ethyl chloroformate	3, 16°(a)	336	1182	3 + 6.1
Ethyl-2 chloropropionate	3, 31°(c)	30	2935	3
Ethylchlorothioformate	8, 64°(b)	80	2826	8
Ethyl crotonate	3, 3°(b)	33	1862	3
Ethyl cyanoacetate	6.1, 12°(c)	60	2666	6.1A
Ethyldichloroarsine	6.1, 34°(a)	66	1892	6.1
Ethyl dichlorosilane	4.3, 1°(a)	X338	1183	4.3 + 3 + 8
Ethylene	2, 5°(b)	23	1962	3
Ethylene, acetylene and propylene in mixtures, refrigerated liquid	2, 8°(b)	223	3138	3+13
Ethylene, liquid, deeply-refrigerated	2, 7°(b)	223	1038	3
Ethylene chlorohydrin (2-Chloroethanol)	6.1, 16°(b)	60	1135	6.1
Ethylenediamine	8, 53°(b)	83	1604	8 + 3
Ethylene dibromide (sym.-Dibromoethane)	6.1, 15°(b)	60	1605	6.1
Ethylene dichloride: see 1,2-Dichloroethane				
Ethylene glycol diethyl ether: see 1,2-Diethoxyethane				
Ethylene glycol monobutyl ether	6.1, 13°(c)	60	2369	6.1A
Ethylene glycol monoethyl ether: see 2-Ethoxyethanol				
Ethylene glycol monoethyl ether acetate: see 2-Ethoxyethyl acetate				
Ethylene glycol monomethyl ether acetate	3, 31°(c)	30	1189	3
Ethyleneimine	3, 12°	336	1185	3 + 6.1
Ethylene oxide and propylene oxide mixtures, with not more than 30% ethylene oxide	3, 17°(a)	336	2983	3 + 6.1
Ethylene oxide with not more than 10% carbon dioxide by mass	2, 4°(ct)	236	1041	3 + 6.1
Ethylene oxide with more than 10% but not more than 50% carbon dioxide by mass	2, 6°(ct)	236	1041	3 + 6.1
Ethylene oxide containing carbon dioxide: see Carbon dioxide containing ethylene oxide				

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Ethylene oxide with nitrogen	2, 4°(ct)	236	1040	3 + 6.1
Ethyl ether	3, 2°(a)	33	1155	3
Ethyl fluid	6.1, 31°(a)	66	1649	6.1
Ethyl formate	3, 3°(b)	33	1190	3
2-Ethyl hexaldehyde	3, 31°(c)	30	1191	3
2-Ethylhexylamine	8, 53°(c)	83	2276	8 + 3
2-Ethylhexyl chloroformate	6.1, 16°(b)	68	2748	6.1 + 8
Ethylidene chloride: see 1,1-Dichloroethane				
Ethyl isobutyrate	3, 3°(b)	33	2385	3
Ethyl lactate	3, 31°(c)	30	1192	3
Ethyl mercaptan	3, 18°(b)	336	2363	3 + 6.1
Ethyl methacrylate	3, 3°(b)	339	2277	3
Ethyl methyl ketone	3, 3°(b)	33	1193	3
Ethyl orthoformate	3, 31°(c)	30	2524	3
Ethyl oxalate	6.1, 13°(c)	60	2525	6.1A
Ethylphenyldichlorosilane	8, 37°(b)	X80	2435	8
1-Ethylpiperidine	3, 3°(b)	33	2386	3
Ethyl propionate	3, 3°(b)	33	1195	3
Ethyl propyl ether	3, 3°(b)	33	2615	3
Ethyl sulphide	3, 18°(b)	336	2375	3 + 6.1
Ethylsulphuric acid	8, 34°(b)	80	2571	8
Ethyltoluidines	6.1, 12°(b)	60	2754	6.1
Ethyltrichlorosilane	3, 21°(a)	X338	1196	3 + 8
Extracts, flavourings				
- with a flash-point below 21°C	3, 3°(b)	33	1197	3
- with a flash-point between 21°C and 55° C	3, 31°(c)	30	1197	3
- with a flash-point above 55° C	3, 32°(c)	30	1197	-
Extracts aromatic				
- with a flash-point below 21°C	3, 3°(b)	33	1169	3
- with a flash-point between 21°C and 55° C	3, 31°(c)	30	1169	3
- with a flash-point above 55° C	3, 32°(c)	30	1169	-
Ferric chloride (Iron trichloride), anhydrous ($FeCl_3$)	8, 22°(c)	80	1773	8
Ferric chloride (Iron trichloride), aqueous solutions of	8, 5°(c)	80	2582	8
Ferric nitrate	5.1,22°(c)	50	1466	5.1
Ferrocerium	4.1,13°(b)	40	1323	4.1
Ferrosilicon	4.3,15°(c)	462	1408	4.3+6.1
Fluoboric acid, aqueous solutions of, with not more than 78% pure acid (HBF_4)	8, 8°(b)	80	1775	8
Fluoranilines	6.1, 11°(c)	60	2941	6.1A
Fluorobenzene	3, 3°(b)	33	2387	3
Fluorophosphoric acid, anhydrous	8, 10°(b)	80	1776	8
Fluorosulphonic acid	8, 10°(a)	88	1777	8
Fluorotoluenes				
- with a flash-point below 21°C	3, 3°(b)	33	2388	3
- with a flash-point between 21°C and 55°C (limit values included)	3, 31° (c)	30	2388	3

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Fluosilicic acid (Hydrofluosilicic acid) (H_2SiF_6)	8, 9°(b)	80	1778	8
Formaldehyde, aqueous solutions of (e.g. Formalin), with not less than 5% formaldehyde, also with not more than 35% methanol				
- having a flash-point between 21°C and 55°C (limit values included)	8, 63°(c)	83	1198	8 + 3
- having a flash-point above 55°C	8, 63°(c)	80	2209	8
Formic acid with more than 70% pure acid	8, 32°(b)	80	1779	8
Formic acid with from 50 to 70% pure acid	8, 32°(c)	80	1779	8
Fumaryl chloride	8, 36°(b)	80	1780	8
Furan	3, 1°(a)	33	2389	3
Furfural (Furfuraldehyde)	3, 32°(c)	30	1199	-
Furfurylamine	3, 31°(c)	30	2526	3
Furfuryl alcohol	6.1, 13°(c)	60	2874	6.1A
Fusel oil				
- with a flash-point below 21°C	3, 3°(b)	33	1201	3
- with a flash-point between 21°C and 55°C	3, 31°(c)	30	1201	3
- with a flash-point above 55°C	3, 32°(c)	30	1201	-
Gas mixture R 500	2, 4°(a)	20	2602	2
Gas mixture R 502	2, 4°(a)	20	1973	2
Gas mixture R 503	2, 6°(a)	20	2599	2
Gas oil, for heating and for diesel engines: see Hydrocarbons, liquid				
Glycerol alpha-monochlorohydrin (3-Chloropropane-1,2-diol)	6.1, 17°(c)	60	2689	6.1A
Glycidaldehyde	6.1, 13°(b)	63	2622	6.1 + 3
Guanidine nitrate	5.1, 22°(c)	50	1467	5.1
Hafnium powder, wetted	4.1, 13°(b)	40	1326	4.1
Hafnium powder, dry	4.2, 12°(b)	40	2545	4.2
	4.2, 12°(c)	40	2545	4.2
Heating oil: see Hydrocarbons, liquid				
Helium, liquid, deeply-refrigerated	2, 7°(a)	22	1963	2
n-Heptaldehyde	3, 31°(c)	30	3056	3
Heptanes	3, 3°(b)	33	1206	3
Heptenes	3, 3°(b)	33	2278	3
Hexachloroacetone	6.1, 17°(c)	60	2661	6.1A
Hexachlorobenzene	6.1, 17°(c)	60	2729	6.1A
Hexachlorobutadiene	6.1, 17°(c)	60	2279	6.1A
Hexachlorocyclopentadiene	6.1, 17°(a)	66	2646	6.1
Hexadecyltrichlorosilane	8, 37°(b)	X80	1781	8
Hexadienes	3, 3°(b)	33	2458	3
Hexafluoroacetone hydrate	6.1, 17°(b)	60	2552	6.1
Hexafluoroethane (R 116)	2, 5°(a)	20	2193	2
Hexafluorophosphoric acid	8, 10°(b)	80	1782	8
Hexafluoropropylene (R 1216)	2, 3°(at)	26	1858	6.1

Name of substance (a)	Class and item number (b)	Hazard identification No. (upper part) (c)	Substance identification No. (lower part) (d)	Label (e)
Hexaldehyde	3, 31°(c)	30	1207	3
Hexamethylenediamine	8, 52°(c)	80	2280	8
Hexamethylenediamine, solutions of	8, 53°(b)	80	1783	8
Hexamethylene diisocyanate	6.1, 19°(b)	60	2281	6.1
Hexamethyleneimine	3, 22°(b)	338	2493	3 + 8
Hexamine	4.1, 6°(c)	40	1328	4.1
Hexanes	3, 3°(b)	33	1208	3
Hexanoic acid: see Caproic acid				
Hexanols				
- with a flash-point between 21°C and 55°C	3, 31°(c)	30	2282	3
- with a flash-point above 55°C	3, 32°(c)	30	2282	-
1-Hexene	3, 3°(b)	33	2370	3
Hexyltrichlorosilane	8, 37°(b)	X80	1784	8
Hydrazine, aqueous solutions of, with not more than 64% hydrazine	8, 44°(b)	86	2030	8 + 6.1
Hydriodic acid, solutions of	8, 5°(b)	80	1787	8
Hydrobromic acid, solutions of	8, 5°(b)	80	1788	8
Hydrocarbons, liquid, pure or in mixtures, not otherwise specified in this Appendix				
- having a flash-point below 21°C	3,1° to 3°	33	1203	3
- having a flash-point between 21°C and 55°C (limit values included)	3, 31°(c)	30	1223	3
- having a flash-point above 55°C	3, 32°(c)	30	1202	-
Hydrochloric acid, solutions of	8, 5°(b)	80	1789	8
Hydrocyanic acid, aqueous solutions of, with not more than 20% pure acid	6.1, 2°	663	1613	6.1 + 3
Hydrofluoric acid and sulphuric acid mixtures	8, 7°(a)	886	1786	8 + 6.1
Hydrofluoric acid, anhydrous (Hydrogen fluoride)	8, 6°	886	1052	8 + 6.1
Hydrofluoric acid, aqueous solutions of, with more than 85% anhydrous hydrofluoric acid	8, 6°	886	1790	8 + 6.1
Hydrofluoric acid, aqueous solutions of, with more than 60% but not more than 85% anhydrous hydrofluoric acid	8, 7°(a)	886	1790	8 + 6.1
Hydrofluoric acid, aqueous solutions of, with not more than 60% anhydrous hydrofluoric acid	8, 7°(b)	886	1790	8 + 6.1
Hydrofluosilicic acid: see Fluosilicic acid				
Hydrogen, liquid, deeply-refrigerated	2, 7°(b)	223	1966	3
Hydrogen bromide	2, 3°(at)	286	1048	8 + 6.1
Hydrogen chloride	2, 5°(at)	286	1050	8 + 6.1
Hydrogen fluoride: see Hydrofluoric acid, anhydrous				
Hydrogen peroxide, stabilized	5.1, 1°(a)	559	2015	5.1+8
Hydrogen peroxide, aqueous solutions, stabilized	5.1, 1°(a)	559	2015	5.1+8
Hydrogen peroxide, aqueous solutions	5.1, 1°(b)	58	2014	5.1+8
Hydrogen peroxide, aqueous solutions	5.1, 1°(c)	50	2984	5.1

Name of substance (a)	Class and item number (b)	Hazard identification No. (upper part) (c)	Substance identification No. (lower part) (d)	Label (e)
Hydrogen peroxide, and peroxyacetic acid mixture, stablized	5.1, 1°(b)	58	3149	5.1+8
Hydrogen sulphide	2, 3°(bt)	236	1053	3 + 6.1
Hydrogen sulphides, aqueous solutions of, not otherwise specified in this Appendix	8, 45°(c)	80	1719	8
Hydroquinone	6.1, 14°(c)	60	2662	6.1A
beta-Hydroxybutyraldehyde: see Aldol				
Hydroxylamine sulphate	8, 27°(c)	80	2865	8
Hypochlorite solutions with not less than 16% available chlorine	8, 61°(b)	85	1791	8
Hypochlorite solutions with more than 5% but less than 16% available chlorine	8, 61°(c)	85	1791	8
3,3'-Imino-bis-propylamine: see Bis-aminopropylamine				
Iodine monochloride	8, 21°(b)	80	1792	8
Iodine pentafluoride	5.1, 5	568	2495	5.1+6.1+8
2-Iodobutane	3, 3°(b)	33	2390	3
Iodomethylpropanes	3, 3°(b)	33	2391	3
Iodopropanes	3, 31°(c)	30	2392	3
Iron oxide, spent	4.2, 16°(c)	40	1376	4.2
Iron pentacarbonyl	6.1, 3°	663	1994	6.1 + 3
Iron sponge, spent	4.2, 16°(c)	40	1376	4.2
Iron trichloride: see Ferric chloride				
Isoamyl formate	3, 31°(c)	30	1109	3
Isobutane	2, 3°(b)	23	1969	3
Isobutanol: see Isobutyl alcohol				
Isobutene: see Isobutylene				
Isobutyl acetate	3, 3°(b)	33	1213	3
Isobutyl acrylate	3, 31°(c)	39	2527	3
Isobutyl alcohol (Isobutanol)	3, 31°(c)	30	1212	3
Isobutylamine	3, 22°(b)	338	1214	3 + 8
Isobutylene (Isobutene)	2, 3°(b)	23	1055	3
Isobutylene trimer: see Triisobutylene				
Isobutyl formate	3, 3°(b)	33	2393	3
Isobutyl isobutyrate	3, 31°(c)	30	2528	3
Isobutyl isocyanate	3, 14°(b)	336	2486	3 + 6.1
Isobutyl methacrylate	3, 31°(c)	39	2283	3
Isobutyl propionate	3, 31°(c)	30	2394	3
Isobutyraldehyde	3, 3°(b)	33	2045	3
Isobutyric acid	8, 32°(c)	80	2529	8
Isobutyric anhydride	8, 32°(c)	80	2530	8
Isobutyronitrile	3, 11°(b)	336	2284	3 + 6.1
Isobutyryl chloride	3, 25°(b)	338	2395	3 + 8
Isocyanatobenzotrifluorides	6.1, 18°(b)	60	2285	6.1
3-Isocyanatomethyl-3, 5, 5-trimethylcyclohexyl isocyanate: see Isophorone diisocyanate				
Isododecane: see Pentamethylheptane				
Isooctene	3, 3°(b)	33	1216	3

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Isopentane	3, 1°(a)	33	1265	3
Isophoronediamine	8, 53°(c)	80	2289	8
Isophorone diisocyanate (3-Isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate)	6.1, 19°(c)	60	2290	6.1A
Isoprene	3, 2°(a)	339	1218	3
Isopropanol (Isopropyl alcohol)	3, 3°(b)	33	1219	3
Isopropenyl acetate	3, 3°(b)	33	2403	3
Isopropyl acetate	3, 3°(b)	33	1220	3
Isopropyl acid phosphate	8, 38°(c)	80	1793	8
Isopropyl alcohol: see Isopropanol				
Isopropylamine	3, 22°(a)	338	1221	3 + 8
Isopropylbenzene: see Cumene				
Isopropyl butyrate	3, 31°(c)	30	2405	3
Isopropylchloride: see 2-Chloropropane				
Isopropyl chloroacetate	3, 32°(c)	30	2947	-
Isopropyl-2-chloropropionate	3, 31°(c)	30	2934	3
Isopropylethylene: see 3-Methyl-1-butene				
Isopropyl isobutyrate	3, 3°(b)	33	2406	3
Isopropyl isocyanate	3, 14°(a)	336	2483	3 + 6.1
Isopropyl nitrate	3, 3°(b)	33	1222	3
Isopropyl propionate	3, 3°(b)	33	2409	3
Kerosene: see Hydrocarbons, liquid				
Krypton, liquid, deeply-refrigerated	2, 7°(a)	22	1970	2
Lead acetate	6.1, 62°(c)	60	1616	6.1A
Lead alkyls with halogenated organic compounds, mixtures of	6.1, 31°(a)	66	1649	6.1
Lead dioxide	5.1, 29°(c)	56	1872	5.1+6.1
Lead nitrate	5.1, 29°(b)	56	1469	5.1+6.1
Lead perchlorate	5.1, 29°(b)	56	1470	5.1+6.1
Lead phosphite dibasic	4.1, 11°(b) 4.1, 11°(c)	40 40	2989 2989	4.1 4.1
Lead sulphate with 3% or more free sulphuric acid	8, 23°(b)	80	1794	8
Lithium	4.3, 11°(a)	X423	1415	4.3
Lithium alkyls	4.2, 31°(a)	X333	2445	4.2+4.3
Lithium ferrosilicon	4.3, 12°(b)	423	2830	4.3
Lithium hydride, solid, castings	4.3, 16°(b)	423	2805	4.3
Lithium hydroxide	8, 41°(b)	80	2680	8
Lithium hydroxide, solutions of	8, 42°(b)	80	2679	8
Lithium hypochlorite, dry	5.1, 15°(b)	50	1471	5.1
Lithium hypochlorite, mixtures	5.1, 15°(b)	50	1471	5.1
Lithium nitrate	5.1, 22°(c)	50	2722	5.1
Lithium peroxide	5.1, 25°(b)	50	1472	5.1
Lithium silicon	4.3, 12°(b)	423	1417	4.3
LPG: see Mixtures of hydrocarbons (liquefied gas) (Mixtures A, A0, A1, B and C)				
Magnesium	4.1, 13°(c)	40	1869	4.1

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Magnesium alkyls	4.2, 31°(a)	X333	3053	4.2+4.3
Magnesium alloys	4.1, 13°(c)	40	1869	4.1
Magnesium alloys powdered	4.3, 14°(b)	423	1418	4.3+4.2
Magnesium arsenate	6.1, 51°(b)	60	1622	6.1
Magnesium bromate	5.1, 16°(b)	50	1473	5.1
Magnesium chlorate	5.1, 11°(b)	50	2723	5.1
Magnesium diamide	4.2, 16°(b)	40	2004	4.2
Magnesium diphenyl	4.2, 31°(a)	X333	2005	4.2+4.3
Magnesium granules coated	4.3, 11°(c)	423	2950	4.3
Magnesium nitrate	5.1, 22°(c)	50	1474	5.1
Magnesium perchlorate	5.1, 13°(b)	50	1475	5.1
Magnesium peroxide	5.1, 25°(b)	50	1476	5.1
Magnesium powder	4.3, 14°(b)	423	1418	4.3+4.2
Magnesium silicide	4.3, 12°(b)	423	2624	4.3
Maleic anhydride	8, 31°(c)	80	2215	8
Malononitrile	6.1, 12°(b)	60	2647	6.1
Maneb (Manganese ethylene-1,2-di-dithio carbamate)	4.2, 16°(c)	40	2210	4.2+4.3
Maneb stabilized	4.3, 20°(c)	423	2968	4.3
Maneb preparations, stablized	4.3, 20°(c)	423	2968	4.3
Maneb preparations	4.2, 16°(c)	40	2210	4.2+ 4.3
Manganese ethylene-1,2-di-dithio carbamate see: Maneb				
Manganese nitrate	5.1, 22°(c)	50	2724	5.1
Manganese resinate	4.1, 12°(c)	40	1330	4.1
Mercaptoethanol (Thioglycol)	6.1, 20°(b)	60	2966	6.1
Mercuric chloride	6.1, 52°(b)	60	1624	6.1
Mercury acetate	6.1, 52°(b)	60	1629	6.1
Mesitylene (1,3,5-Trimethylbenzene)	3, 31°(c)	30	2325	3
Mesityl oxide	3, 31°(c)	30	1229	3
Metal catalyst, dry	4.2, 12°(b) 4.2, 12°(c)	40 40	2881 2881	4.2 4.2
Metal catalyst, wetted	4.2, 12°(b)	40	1378	4.2
Metaldehyde	4.1, 6°(c)	40	1332	4.1
Methacrylaldehyde	3, 17°(b)	336	2396	3 + 6.1
Methacrylic acid	8, 32°(c)	89	2531	8
Methallyl alcohol	3, 31°(c)	30	2614	3
Methane, liquid, deeply-refrigerated	2, 7°(b)	223	1972	3
Methanol (Methyl alcohol)	3, 17°(b)	336	1230	3 + 6.1
Methoxybutyl acetate: see Butoxyl				
4-Methoxy-4-methylpentan-2-one	3, 31°(c)	30	2293	3
Methoxyethanol	3, 31°(c)	30	1188	3
Methoxymethyl isocyanate	3, 14°(a)	336	2605	3 + 6.1
Methyl acetate	3, 3°(b)	33	1231	3
Methyl acrylate	3, 3°(b)	339	1919	3
Methylal: see Dimethoxymethane				

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Methyl alcohol: see Methanol				
Methyl allyl chloride	3, 3°(b)	33	2554	3
Methylamine, anhydrous	2, 3°(bt)	236	1061	3 +6.1
Methylamine, aqueous solutions of				
- having a boiling point not more than 35°C	3, 22°(a)	338	1235	3 + 8
- having a boiling point higher than 35°C	3, 22°(b)	338	1235	3 + 8
Methyl amyl acetate	3, 31°(c)	30	1233	3
Methyl amyl alcohol (Methyl isobutyl carbinol)	3, 31°(c)	30	2053	3
N-Methylaniline	6.1, 11°(c)	60	2294	6.1A
Methyl benzoate	6.1, 13°(c)	60	2938	6.1A
Alpha-Methylbenzyl alcohol	6.1, 14°(c)	60	2937	6.1A
Methyl bromide	2, 3°(at)	26	1062	6.1
Methyl bromoacetate	6.1, 16°(b)	63	2643	6.1 + 3
3-Methylbutan-2-one	3, 3°(b)	33	2397	3
2-Methyl-1-butene	3, 1°(a)	33	2459	3
3-Methyl-1-butene (Isopropylethylene)	3, 1°(a)	33	2561	3
2-Methyl-2-butene	3, 2°(b)	33	2460	3
Methyl tert-butyl ether	3, 3°(b)	33	2398	3
N-Methylbutylamine	3, 22°(b)	338	2945	3 + 8
Methyl butyrate	3, 3°(b)	33	1237	3
Methyl chloride	2, 3°(bt)	236	1063	3 + 6.1
Methyl chloroacetate	6.1, 16°(b)	63	2295	6.1 + 3
Methyl chloroformate	3, 16°(a)	336	1238	3 + 6.1
Methylchloromethyl ether	3, 16°(b)	336	1239	3 + 6.1
Methyl-2-chloropropionate	3, 31°(c)	30	2933	3
Methylcyclohexane	3, 3°(b)	33	2296	3
Methylcyclohexanols				
- with a flash-point between 21°C and 55°C	3, 31°(c)	30	2617	3
- with a flash-point above 55°C	3, 32°(c)	30	2617	-
Methylcyclohexanone	3, 31°(c)	30	2297	3
Methylcyclopentane	3, 3°(b)	33	2298	3
Methyl dichloroacetate	6.1, 16°(c)	60	2299	6.1A
Methyldichlorosilane	4.3, 1°(a)	X338	1242	4.3 + 3 + 8
Methylene bromide (Dibromomethane)	6.1, 15°(c)	60	2664	6.1A
Methylene chloride (Dichloromethane)	6.1, 15°(c)	60	1593	6.1A
2-Methyl-5-ethyl pyridine	6.1, 11°(c)	60	2300	6.1A
Methyl formate	3, 1°(a)	33	1243	3
2-Methylfuran	3, 3°(b)	33	2301	3
5-Methylhexan-2-one	3, 31°(c)	30	2302	3
Methylhydrazine	3, 23°(a)	338	1244	3 + 8
Methyl iodide	6.1, 15°(b)	60	2644	6.1
Methyl isobutyl carbinol: see Methyl amyl alcohol				
Methyl isobutyl ketone	3, 3°(b)	33	1245	3
Methyl isopropenyl ketone	3, 3°(b)	339	1246	3
Methyl isopropyl benzenes: see Cymenes				

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Methyl isothiocyanate	6.1, 20°(c)	63	2477	6.1A + 3
Methyl isovalerate	3, 3°(b)	33	2400	3
Methyl magnesium bromide in ethyl ether	4.3, 3°(a)	X323	1928	4.3 + 3
Methyl mercaptan	2, 3°(bt)	236	1064	6.1 + 3
Methyl methacrylate	3, 3°(b)	339	1247	3
Methylmorpholines				
- having a flash-point below 21°C	3, 22°(b)	338	2535	3 + 8
- having a flash-point of 21°C or over	8, 53°(b)	83	2535	8 + 3
Methyl orthosilicate (Tetramethoxysilane)	3, 17°(a)	336	2606	3 + 6.1
2-Methylpentan-2-ol	3, 31°(c)	30	2560	3
Methylpentadienes	3, 3°(b)	33	2461	3
3-Methyl-2-pentene-4-yne-1-ol: see 1-Pentol				
Methylphenyldichlorosilane	8, 37°(b)	X80	2437	8
1-Methyl piperidine	3, 3°(b)	33	2399	3
Methyl propionate	3, 3°(b)	33	1248	3
Methyl propyl ether	3, 2°(b)	33	2612	3
Methyl propyl ketone	3, 3°(b)	33	1249	3
Methylpyridines: see Picolines				
alpha-Methylstyrene	3, 31°(c)	30	2303	3
Methyltetrahydrofuran	3, 3°(b)	33	2536	3
Methyl trichloroacetate	6.1, 16°(c)	60	2533	6.1A
Methyltrichlorosilane	3, 21°(a)	X338	1250	3 + 8
2-Methyl valeraldehyde	3, 3°(b)	33	2367	3
Methyl vinyl ether	2, 3°(ct)	235	1087	3 + 6.1
Methyl vinyl ketone	3, 3°(b)	339	1251	3
Mixtures F 1, F 2 and F 3	2, 4°(a)	20	1078	2
Mixtures of 1,3-butadiene and hydrocarbons	2, 4°(c)	239	1010	3
Mixtures of caustic soda and quicklime: see Soda lime				
Mixtures of hydrocarbons (liquefied gas) (Mixtures A, A 0, A 1, B and C)	2, 4°(b)	23	1965	3
Mixtures of methylacetylene and propadiene with hydrocarbons (Mixtures P 1 and P 2)	2, 4°(c)	239	1060	3
Mixtures of methyl bromide and chloropicrin (liquefied gas)	2, 4°(at)	26	1581	6.1
Mixtures of methyl chloride and chloropicrin (liquefied gas)	2, 4°(bt)	236	1582	3 + 6.1
Mixtures of methyl chloride and methylene chloride (liquefied gas)	2, 4°(bt)	236	1912	3 + 6.1
Mixtures of sulphuric acid and more than 30% pure nitric acid	8, 3°(a)	885	1796	8
Mixtures of sulphuric acid and not more than 30% pure nitric acid	8, 3°(b)	88	1796	8
Molybdenum pentachloride ($MoCl_5$)	8, 22°(c)	80	2508	8
Monochloroacetic acid, solid: see Chloroacetic acid, solid				

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Monochloroacetic acid, in the molten state: see Chloroacetic acid, in the molten state				
Monochloroacetic acid, solutions of: see Chloroacetic acid, solutions of				
Monochloroacetonitrile	6.1, 11°(b)	60	2668	6.1
Monochloroanilines, liquid	6.1, 12°(b)	60	2019	6.1
Monochloroanilines, solid	6.1, 12°(b)	60	2018	6.1
Mononitroanilines	6.1, 12°(b)	60	1661	6.1
Mononitrotoluenes	6.1, 12°(b)	60	1664	6.1
Morpholine	3, 31°(c)	30	2054	3
Mysorite: see Brown asbestos				
Naphthalene, molten	4.1, 5°	44	2304	4.1
Naphthalene, pure or refined	4.1, 6°	40	1334	4.1
Naphtha, solvent: see Hydrocarbons, liquid				
beta-Naphthylamine	6.1, 12°(b)	60	1650	6.1
Natural gas, condensation products of: see Hydrocarbons, liquid				
Natural gas, liquid, deeply-refrigerated	2, 8°(b)	223	1972	3
Neon, liquid, deeply-refrigerated	2, 7°(a)	22	1913	2
Nickel nitrate	5.1, 22°(c)	50	2725	5.1
Nickel nitrite	5.1, 23°(c)	50	2726	5.1
Nickel tetracarbonyl	6.1, 3°	663	1259	6.1 + 3
Nicotine sulphate	6.1, 77°(b)	60	1658	6.1
Nitrating acid mixtures, spent	8, 3°(b)	80	1826	8
Nitric acid, red fuming	8, 2°(a)	856	2032	8
Nitric acid with more than 70% pure acid	8, 2°(a)	885	2032	8
Nitric acid with not more than 70% pure acid	8, 2°(b)	80	2031	8
Nitric acid, mixtures with sulphuric acid: see Mixtures of sulphuric acid and nitric acid				
Nitroanisoles	6.1, 12°(c)	60	2730	6.1A
Nitrobenzene	6.1, 12°(b)	60	1662	6.1
Nitrobenzenesulphonic acid	8, 34°(b)	80	2305	8
Nitrobenzotrifluorides	6.1, 12°(b)	60	2306	6.1
Nitrobromobenzenes	6.1, 12°(c)	60	2732	6.1A
Nitrocellulose solutions: see Collodions, solutions of				
3-Nitro-4-chlorobenzotrifluoride	6.1, 12°(b)	60	2307	6.1
Nitrocresols	6.1, 12°(c)	60	2446	6.1A
Nitroethane	3, 31°(c)	30	2842	3
Nitrogen, liquid, deeply-refrigerated	2, 7°(a)	22	1977	2
Nitrogen dioxide NO_2 (Nitrogen peroxide, Nitrogen tetroxide N_2O_4)	2, 3°(at)	265	1067	6.1 + 05
Nitronaphtalene	4.1, 6°(c)	40	2538	4.1

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Nitrophenols	6.1, 12°(c)	60	1663	6.1A
Nitropropanes	3, 31°(c)	30	2608	3
p-Nitrosodimethylaniline	4.2, 5°(b)	40	1369	4.2
Nitrosylsulphuric acid	8, 1°(b)	88	2308	8
Nitrous oxide N_2O	2, 5°(a)	25	1070	2+05
Nitrous oxide N_2O, deeply-refrigerated	2, 7°(a)	225	2201	2+05
Nitroxylenes	6.1, 12°(b)	60	1665	6.1
Nonane	3, 31°(c)	30	1920	3
Nonyltrichlorosilane	8, 37°(b)	X80	1799	8
2,5-Norbornadiene (Dicycloheptadiene)	3, 3°(b)	33	2251	3
Octadecyltrichlorosilane	8, 37°(b)	X80	1800	8
Octadienes				
- having a flash-point below 21°C	3, 3°(b)	33	2309	3
- having a flash-point between 21°C and 55°C (limit values included)	3, 31°(c)	30	2309	3
Octafluorocyclobutane (RC 318)	2, 3°(a)	20	1976	2
Octanes	3, 3°(b)	33	1262	3
tert-Octylmercaptan	6.1, 20°(b)	63	3023	6.1 + 3
Octyltrichlorosilane	8, 37°(b)	X83	1801	8 + 3
Oleum (Sulphuric acid) fuming	8, 1°(a)	X886	1831	8 + 6.1
Organic peroxide type F, liquid	5.2, 9°(b)	539	3109	5.2
Organic peroxide type F, liquid temperature controlled	5.2, 19°(b)	539	3119	5.2
Organic peroxide type F, solid	5.2, 10°(b)	539	3110	5.2
Organic peroxide type F, solid temperature controlled	5.2, 20°(b)	539	3120	5.2
Ortho-phosphorous acid	8, 11°(c)	80	2834	8
Oxalates, soluble in water	6.1, 67°(c)	60	2449	6.1A
Oxygen, liquid, deeply refrigerated	2, 7°(a)	225	1073	2 + 05
Paints				
- having a flash-point below 21°C	3, 5°	33	1263	3
- having a flash-point between 21°C and 55°C (limit values included)	3, 31°(c)*/	30	1263	3
- having a flash-point above 55°C	3, 32°(c)*/	30	1263	-
Paraldehyde	3, 31°(c)	30	1264	3
Paraformaldehyde	4.1, 6°(c)	40	2213	4.1
Pentaborane	4.2, 19°(a)	333	1380	4.2+6.1
Pentachloroethane	6.1, 15°(b)	60	1669	6.1
Pentafluoroethane (R 125)	2, 5°(a)	20	3220	2
Pentamethylheptane (Isododecane)	3, 31°(c)	30	2286	3
Pentan-2,4-dione (Acetyl acetone)	3, 31°(c)	30	2310	3
Pentane, normal	3, 2°(b)	33	1265	3
1-Pentene: see Amylene, normal				

*/ See, however, NOTE under section D of marginal 2301.

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
1-Pentol (3-Methyl-2-pentene-4-yne-1-Ol)	8, 66°(b)	80	2705	8
Perchloric acid in aqueous solution with more than 50% but not more than 72% acid, by mass	5.1, 3°(a)	558	1873	5.1 + 8
Perchloric acid, aqueous solutions of, with more than 50% pure acid ($HClO_4$)	8, 4°(b)	85	1802	8
Perchloroethylene: see Tetrachloroethylene				
Perchloromethylmercaptan	6.1, 16°(a)	66	1670	6.1
Perfumery products				
- with a flash-point below 21°C	3, 33°(b)	33	1266	3
- with a flash-point between 21°C and 55°C	3, 31°(c)	30	1266	3
- with a flash-point above 55°C	3, 32°(c)	30	1266	-
Pesticides, benzoic derivatives				
- solid	6.1, 83°(b) 83°(c)	60 60	2769 2769	6.1 6.1A
- liquid, with a flash-point below 21°C	3, 19° 6°	336 33	2770 2770	3 + 6.1 3 + 6.1A
- liquid, with a flash-point between 21°C and 55°C	6.1, 83°(a) 83°(b) 83°(c)	663 63 63	3003 3003 3003	6.1 + 3 6.1 + 3 6.1A + 3
- liquid, not flammable or with a flash-point above 55°C	6.1, 83° (a) 83° (b) 83° (c)	66 60 60	3004 3004 3004	6.1 6.1 6.1A
Pesticides, carbamates				
- solid	6.1 76°(b) 76°(c)	 60 60	 2757 2757	 6.1 6.1A
- liquid, having a flash-point below 21°C	3, 19° 6°	336 33	2758 2758	3 + 6.1 3 + 6.1A
- liquid, having a flash-point of 21°C - 55°C	6.1, 76°(a) 76°(b) 76°(c)	663 63 63	2991 2991 2991	6.1 + 3 6.1 + 3 6.1A + 3
- liquid, not flammable or having a flash-point above 55°C	6.1, 76°(a) 76°(b) 76°(c)	66 60 60	2992 2992 2992	6.1 6.1 6.1A
Pesticides, chlorinated hydrocarbons				
- solid	6.1 72°(b) 72°(c)	 60 60	 2761 2761	 6.1 6.1A
- liquid, having a flash-point below 21°C	3, 19° 6°	336 33	2762 2762	3 + 6.1 3 + 6.1A
- liquid, having a flash-point of 21°C - 55°C	6.1, 72°(a) 72°(b) 72°(c)	663 63 63	2995 2995 2995	6.1 + 3 6.1 + 3 6.1A + 3
- liquid, not flammable or having a flash-point above 55°C	6.1, 72°(a) 72°(b) 72°(c)	66 60 60	2996 2996 2996	6.1 6.1 6.1A
Pesticides, chloro-phenoxyacetic derivatives				
- solid	6.1 73°(b) 73°(c)	 60 60	 2765 2765	 6.1 6.1A

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
(cont'd)				
- liquid, having a flash-point below 21°C	3, 19°	336	2766	3 + 6.1
	6°	33	2766	3 + 6.1A
- liquid, having a flash-point of 21°C - 55°C	6.1, 73°(a)	663	2999	6.1 + 3
	73°(b)	63	2999	6.1 + 3
	73°(c)	63	2999	6.1A + 3
- liquid, not flammable or having a flash-point above 55°C	6.1, 73°(a)	66	3000	6.1
	73°(b)	60	3000	6.1
	73°(c)	60	3000	6.1A
Pesticides, derivatives of bipyridyl				
- solid	6.1			
	82°(b)	60	2781	6.1
	82°(c)	60	2781	6.1A
- liquid, having a flash-point below 21°C	3, 19°	336	2782	3 + 6.1
	6°	33	2782	3 + 6.1A
- liquid, having a flash-point of 21°C - 55°C	6.1, 82°(a)	663	3015	6.1 + 3
	82°(b)	63	3015	6.1 + 3
	82°(c)	63	3015	6.1A + 3
- liquid, not flammable or having a flash-point above 55°C	6.1, 82°(a)	66	3016	6.1
	82°(b)	60	3016	6.1
	82°(c)	60	3016	6.1A
Pesticides, inorganic compounds of arsenic				
- solid	6.1			
	84°(b)	60	2759	6.1
	84°(c)	60	2759	6.1A
- liquid, having a flash-point below 21°C	3, 19°	336	2760	3 + 6.1
	6°	33	2760	3 + 6.1A
- liquid, having a flash-point of 21°C - 55°C	6.1, 84°(a)	663	2993	6.1 + 3
	84°(b)	63	2993	6.1 + 3
	84°(c)	63	2993	6.1A + 3
- liquid, not flammable or having a flash-point above 55°C	6.1, 84°(a)	66	2994	6.1
	84°(b)	60	2994	6.1
	84°(c)	60	2994	6.1A
Pesticides, inorganic compounds of copper	6.1			
- solid	87°(b)	60	2775	6.1
	87°(c)	60	2775	6.1A
- liquid, having a flash-point below 21°C	3, 19°	336	2776	3 + 6.1
	6°	33	2776	3 + 6.1A
- liquid, having a flash-point of 21°C - 55°C	6.1, 87°(a)	663	3009	6.1 + 3
	87°(b)	63	3009	6.1 + 3
	87°(c)	63	3009	6.1A + 3
- liquid, not flammable or having a flash-point above 55°C	6.1, 87°(a)	66	3010	6.1
	87°(b)	60	3010	6.1
	87°(c)	60	3010	6.1A
Pesticides, inorganic compounds of mercury				
- solid	6.1			
	86°(b)	60	2777	6.1
	86°(c)	60	2777	6.1A
- liquid, having a flash-point below 21°C	3, 19°	336	2778	3 + 6.1
	6	33	2778	3 + 6.1A
- liquid, having a flash-point of 21°C - 55°C	6.1, 86°(a)	663	3011	6.1 + 3
	86°(b)	63	3011	6.1 + 3
	86°(c)	63	3011	6.1A+ 3
- liquid, not flammable or having a flash-point above 55°C	6.1, 86°(a)	66	3012	6.1
	86°(b)	60	3012	6.1
	86°(c)	60	3012	6.1A

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Pesticides, organo-phosphorus compounds				
- solid	6.1			
	71°(b)	60	2783	6.1
	71°(c)	60	2783	6.1A
- liquid, having a flash-point below 21°C	3, 19°	336	2784	3 +6.1
	6°	33	2784	3 +6.1A
- liquid, having a flash-point of 21°C - 55°C	6.1, 71°(a)	663	3017	6.1 + 3
	71°(b)	63	3017	6.1 + 3
	71°(c)	63	3017	6.1A + 3
- liquid, not flammable or having a flash-point above 55°C	6.1, 71°(a)	66	3018	6.1
	71°(b)	60	3018	6.1
	71°(c)	60	3018	6.1A
Pesticides, organotin compounds				
- solid	6.1			
	79°(b)	60	2786	6.1
	79°(c)	60	2786	6.1A
- liquid, having a flash-point below 21°C	3, 19°	336	2787	3 + 6.1
	6°	33	2787	3 + 6.1A
- liquid, having a flash-point of 21°C - 55°C	6.1, 79°(a)	663	3019	6.1 + 3
	79°(b)	63	3019	6.1 + 3
	79°(c)	63	3019	6.1A + 3
- liquid, not flammable or having a flash-point above 55°C	6.1, 79°(a)	66	3020	6.1
	79°(b)	60	3020	6.1
	79°(c)	60	3020	6.1A
Pesticides , phenyl urea derivatives				
- solid	6.1, 75°(b)	60	2767	6.1
	75°(c)	60	2767	6.1A
- liquid, with a flash-point below 21°C	3, 19°	336	2768	3 + 6.1
	6°	33	2768	3 + 6.1A
- liquid, with a flash-point between 21°C and 55°C	6.1, 75°(a)	663	3001	6.1 + 3
	75°(b)	63	3001	6.1 + 3
	75°(c)	63	3001	6.1A + 3
- liquid, not flammable or with a flash-point above 55°C	6.1, 75°(a)	66	3002	6.1
	75°(b)	60	3002	6.1
	75°(c)	60	3002	6.1A
Pesticides, phthalimide derivatives				
- solid	6.1, 75°(b)	60	2773	6.1
	75°(c)	60	2773	6.1A
- liquid, with a flash-point below 21°C	3, 19°	336	2774	3 + 6.1
	6°	33	2774	3 + 6.1A
- liquid, with a flash-point between 21°C and 55°C	6.1, 75°(a)	663	3007	6.1 + 3
	75°(b)	63	3007	6.1 + 3
	75°(c)	60	3007	6.1A
- liquid, not flammable or with a flash-point above 55°C	6.1, 75°(a)	66	3008	6.1
	75°(b)	60	3008	6.1
	75°(c)	60	3008	6.1A

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Pesticides, thiocarbamates				
- solid	6.1			
	76°(b)	60	2771	6.1
	76°(c)	60	2771	6.1A
- liquid, having a flash-point below 21°C	3, 19°	336	2772	3 + 6.1
	6°	33	2772	3 + 6.1A
- liquid, having a flash-point of 21°C - 55°C	6.1, 76°(a)	663	3005	6.1 + 3
	76°(b)	63	3005	6.1 + 3
	76°(c)	63	3005	6.1A + 3
- liquid, not flammable or having a flash-point above 55°C	6.1, 76°(a)	66	3006	6.1
	76°(b)	60	3006	6.1
	76°(c)	60	3006	6.1A
Pesticides, triazine derivatives				
- solid	6.1, 75°(b)	60	2763	6.1
	75°(c)	60	2763	6.1A
- liquid, with a flash-point below 21°C	3, 19°	336	2764	3 + 6.1
	6°	33	2764	3 + 6.1A
- liquid, with a flash-point between 21°C and 55°C	6.1, 75°(a)	663	2997	6.1 + 3
	75°(b)	63	2997	6.1 + 3
	75°(c)	63	2997	6.1A + 3
- liquid, not flammable or with a flash-point above 55°C	6.1, 75°(a)	66	2998	6.1
	75°(b)	60	2998	6.1
	75°(c)	60	2998	6.1A
Pesticides, with substituted nitrophenol				
- solid	6.1, 75°(b)	60	2779	6.1
	75°(c)	60	2779	6.1A
- liquid, with a flash-point below 21°C	3, 19°	336	2780	3 + 6.1
	6°	33	2780	3 + 6.1A
- liquid, with a flash-point between 21°C and 55°C	6.1, 75° (a)	663	3013	6.1 + 3
	75° (b)	63	3013	6.1 + 3
	75° (c)	63	3013	6.1A + 3
- liquid, not flammable or with a flash-point above 55°C	6.1, 75°(a)	66	3014	6.1
	75°(b)	60	3014	6.1
	75°(c)	60	3014	6.1A
Petroleum: see Hydrocarbons, liquid				
Petroleum, crude: see Hydrocarbons, liquid				
Petroleum, ether: see Hydrocarbons, liquid				
Petrols: see Hydrocarbons, liquid				
Phenacyl bromide (omega-Bromoacetophenone)	6.1, 17°(b)	60	2645	6.1
Phenacyl chloride (omega-Chloroacetophenone)	6.1, 17°(b)	60	1697	6.1
Phenetidines	6.1, 12°(c)	60	2311	6.1A
Phenol, in the molten state	6.1, 13°(b)	68	2312	6.1
Phenol, solutions of	6.1, 13°(b)	68	2821	6.1
Phenolsulphonic acid, liquid	8, 34°(b)	80	1803	8
Phenylacetonitrile: see Benzyl cyanide				

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Phenylacetyl chloride	8, 36°(b)	80	2577	8
Phenylcarbylamine chloride	6.1, 17°(a)	66	1672	6.1
Phenyl chloride: see Chlorobenzene				
Phenylchloroformate	6.1, 16°(b)	68	2746	6.1 + 8
Phenylenediamines	6.1, 12°(c)	60	1673	6.1A
Phenylhydrazine	6.1, 12°(b)	60	2572	6.1
Phenyl isocyanate	6.1, 18°(b)	63	2487	6.1 + 3
Phenyl methyl ether (Anisole)	3, 31°(c)	30	2222	3
Phenyl phosphorus dichloride	8, 36°(b)	80	2798	8
Phenylthiophosphoryl dichloride	8, 36°(b)	80	2799	8
Phenyltrichlorosilane	8, 37°(b)	X80	1804	8
Phosgene	2, 3°(at)	266	1076	6.1 + 8
9-Phosphabicyclonones (cyclooctadiene phosphines)	4.2, 5°(b)	40	2940	4.2
Phosphoric acid	8, 11°(c)	80	1805	8
Phosphoric acid, anhydrous: see Phosphorus pentoxide				
Phosphorus heptasulphide	4.1, 11°(b)	40	1339	4.1
Phosphorus oxybromide ($POBr_3$)	8, 22°(b)	80	1939	8
Phosphorus oxybromide ($POBr_3$) molten	8, 22°(b)	80	2576	8
Phosphorus oxychloride (Phosphoryl chloride) ($POCl_5$)	8, 21°(b)	80	1810	8
Phosphorus pentachloride (PCl_5)	8, 22°(b)	80	1806	8
Phosphorus pentasulphide	4.3, 20°(b)	423	1340	4.3
Phosphorus pentoxide (phosphoric acid, anhydrous)	8, 27°(b)	80	1807	8
Phosphorus red	4.1, 11°(c)	40	1338	4.1
Phosphorus sesquisulphide	4.1, 11°(b)	40	1341	4.1
Phosphorus tribromide (PBr_3)	8, 21°(b)	80	1808	8
Phosphorus trichloride (PCl_3)	8, 21°(b)	80	1809	8
Phosphorus trisulphide	4.1, 11°(b)	40	1343	4.1
Phosphorus, white or yellow				
- dry	4.2, 11°(a)	46	1381	4.2+6.1
- under water	4.2, 11°(a)	46	1381	4.2+6.1
- in solution	4.2, 11°(a)	46	1381	4.2+6.1
- molten	4.2, 22	446	2447	4.2+6.1
Phosphoryl chloride: see Phosphorus oxychloride				
Phthalic anhydride	8, 31°(c)	80	2214	8
Picolines (Methylpyridines)	3, 31°(c)	30	2313	3
Pine oil	3, 32°(c)	30	1272	-
alpha-Pinene	3, 31°(c)	30	2368	3
Piperazine: see Diethylenediamine				
Piperidine	3, 22°(b)	338	2401	3 + 8
Pivaloyl chloride (Trimethyl acetyl chloride)	8, 36°(b)	83	2438	8 + 3
Polychlorinated biphenyls	9,2°(b)	90	2315	9
Potash lye: seePotassium hydroxide, solutions of				
Potassium	4.3, 11°(a)	X423	2257	4.3

Name of substance (a)	Class and item number (b)	Hazard identification No. (upper part) (c)	Substance identification No. (lower part) (d)	Label (e)
Potassium arsenate	6.1, 51°(b)	60	1677	6.1
Potassium arsenite	6.1, 51°(b)	60	1678	6.1
Potassium bifluoride	8, 26°(b)	80	1811	8 + 6.1
Potassium bisulphate with 3% or more free sulphuric acid	8, 23°(b)	80	2509	8
Potassium bromate	5.1, 16°(b)	50	1484	5.1
Potassium chlorate	5.1, 11°(b)	50	1485	5.1
Potassium chlorate aqueous solution	5.1, 11°(b)	50	2427	5.1
Potassium cyanide, solutions of	6.1, 41°(a)	66	1680	6.1
Potassium dithionite	4.2, 13°(b)	40	1929	4.2
Potassium fluoride	6.1, 65°(c)	60	1812	6.1A
Potassium hydroxide (Caustic potash)	8, 41°(b)	80	1813	8
Potassium hydroxide, solutions of (Potash lye)	8, 42°(b)	80	1814	8
Potassium metal alloys	4.3, 11°(a)	X423	1420	4.3
Potassium nitrate	5.1, 22°(c)	50	1486	5.1
Potassium nitrate and sodium nitrite mixtures	5.1, 24°(b)	50	1487	5.1
Potassium nitrite	5.1, 23°(b)	50	1488	5.1
Potassium oxide	8, 41°(b)	80	2033	8
Potassium perchlorate	5.1, 13°(b)	50	1489	5.1
Potassium permanganate	5.1, 17°(b)	50	1490	5.1
Potassium persulphate	5.1, 18°(c)	50	1492	5.1
Potassium sodium alloys	4.3, 11°(a)	X423	1422	4.3
Potassium sulphide, anhydrous	4.2, 13°(b)	40	1382	4.2
Potassium sulphide with less than 30% water of crystallization	4.2, 13°(b)	40	1382	4.2
Potassium sulphide, aqueous solutions of	8, 45°(c)	80	1847	8
Potassium sulphide with not less than 30% water of crystallization	8, 45°(b)	80	1847	8
Printers inks				
– having a flash-point below 21°C	3, 5°	33	1210	3
– having a flash-point between 21°C and 55°C (limit values included)	3, 31°(c)*/	30	1210	3
– having a flash-point above 55°C	3, 32°(c)*/	30	1210	–
Propane, mixture of gases: see Mixtures of hydrocarbons (liquefied gas) (Mixture C)				
Propane, technically pure	2, 3°(b)	23	1973	3
n-Propanol, technical	3, 3°(b)	33	1274	3
Propionaldehyde	3, 3°(b)	33	1275	3
Propionic acid with not less than 50% pure acid	8, 32°(c)	80	1848	8
Propionic anhydride	8, 32°(c)	80	2496	8
Propionitrile	3, 11°(b)	336	2404	3 + 6.1
Propionyl chloride	3, 25°(b)	338	1815	3 + 8
Propyl acetate	3, 3°(b)	33	1276	3
n-Propylamine	3, 22°(b)	338	1277	3 + 8
n-Propylbenzene	3, 31°(c)	30	2364	3
Propyl chloride: see 1-Chloropropane				
Propylene	2, 3°(b)	23	1077	3
Propylenediamine	8, 53°(b)	83	2258	8 + 3

*/ See, however, NOTE under section D of marginal 2301.

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Propylene dichloride	3, 3°(b)	33	1279	3
Propyleneimine	3, 12°	336	1921	3 + 6.1
Propylene oxide	3, 2°(a)	33	1280	3
Propylene tetramer: see Tetrapropylene				
Propylene trimer: see Tripropylene				
Propyl formates	3, 3°(b)	33	1281	3
Propyl isocyanate, normal	3, 14°(a)	336	2482	3 + 6.1
Propyl mercaptan	3, 3°(b)	33	2402	3
Propyltrichlorosilane	8, 37°(b)	X83	1816	8 + 3
Pyridine	3, 15°(b)	336	1282	3 + 6.1
Pyrosulphuryl chloride ($S_2O_5Cl_2$)	8, 21°(b)	80	1817	8
Pyrrolidine	3, 22°(b)	338	1922	3 + 8
Quinoline	6.1, 12°(c)	60	2656	6.1A
R 12: see Dichlorodifluoromethane				
R 1281: see Bromochlorodifluoromethane				
R 13: see Chlorotrifluoromethane				
R 1381: see Bromotrifluoromethane				
R 21: see Dichlorofluoromethane				
R 22: see Chlorodifluoromethane				
R 23: see Trifluoromethane				
R 114: see 1,2-Dichloro-1,1,2,2-tetrafluoroethane				
R 115: see Chloropentafluoroethane				
R 116: see Hexafluoroethane				
R 124: see 1-Chloro-1,2,2,2,-tetrafluoroethane				
R 125: see Pentafluoroethane				
R 133a: see 1-Chloro-2,2,2-trifluoroethane				
R 134a: see 1,1,1,2-Tetrafluorethane				
R 142b: see 1-Chloro-1,1-difluoroethane				
R 152a: see 1,1-Difluoroethane				
R 500: see Gas mixture R 500				
R 502: see Gas mixture R 502				
R 503: see Gas mixture R 503				
R 1113: see Trifluorochloroethylene				
R 1216: see Hexafluoropropylene				
RC 318: see Octafluorocyclobutane				
Resins in solution in flammable liquids				
- having a flash-point below 21°C	3, 5°	33	1866	3
- having a flash-point between 21°C and 55°C (limit values included)	3, 31°(c)*/	30	1866	3
- having a flash-point above 55°C	3, 32°(c)*/	30	1866	-
Resorcinol	6.1, 14°(c)	60	2876	6.1A
Rosin oil	3, 31°(c)	30	1286	3
Rubber dust	4.1, 1°(b)	40	1345	4.1
Rubber, scrap or shoddy	4.1, 1°(b)	40	1345	4.1

*/ See, however, NOTE under section 0 of marginal 2301.

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Rubber solution				
- with a flash-point below 21°C	3, 3°(b)	33	1287	3
- with a flash-point between 21°C and 55°C	3, 31°(c)	30	1287	3
- with a flash-point above 55°C	3, 32°(c)	30	1287	-
Rubidium	4.3, 11°(a)	X423	1423	4.3
Rubidium hydroxide, solution of	8, 42°(b)	80	2677	8
Selenates, solutions of	6.1, 55°(a)	66	2630	6.1
Selenic acid, solutions of	8, 11°(a)	88	1905	8
Selenites, solutions of	6.1, 55°(a)	66	2630	6.1
Selenium disulphide	6.1, 55°(b)	60	2657	6.1
Selenium metal	6.1, 55°(c)	60	2658	6.1A
Selenium oxychloride	8, 21°(a)	886	2879	8
Silicon powder, amorphous	4.1, 13°(c)	40	1346	4.1
Silicon tetrachloride ($SiCl_4$)	8, 21°(b)	80	1818	8
Silver nitrate	5.1, 22°(b)	50	1493	5.1
Soda lime (Mixtures of caustic soda and quicklime)	8, 41°(c)	80	1907	8
Soda lye: see Sodium hydroxide, solutions of				
Sodium	4.3, 11°(a)	X423	1428	4.3
Sodium aluminate, solutions of	8, 42°(b)	80	1819	8
Sodium aluminium hydride	4.3, 16°(b)	423	2835	4.3
Sodium arsenate	6.1, 51°(b)	60	1685	6.1
Sodium arsenite, solid	6.1, 51°(b)	60	2027	6.1
Sodium arsenite, aqueous, solutions of				
- toxic	6.1, 51°(b)	60	1686	6.1
- harmful	6.1, 51°(c)	60	1686	6.1A
Sodium bifluoride	8, 26°(b)	80	2439	8 + 6.1
Sodium bisulphate, aqueous solutions of	8, 1°(b)	80	2837	8
Sodium bisulphate with 3% or more free sulphuric acid	8, 23°(b)	80	1821	8
Sodium bromate	5.1, 16°(b)	50	1494	5.1
Sodium chlorate	5.1, 11° (b)	50	1495	5.1
Sodium chlorate, aqueous solution	5.1, 11°(b)	50	2428	5.1
Sodium chlorite	5.1, 14°(b)	50	1496	5.1
Sodium cuprocyanide, solutions of	6.1, 41°(a)	66	2317	6.1
Sodium cyanide, solutions of	6.1, 41°(a)	66	1689	6.1
Sodium dithionite	4.2, 13°(b)	40	1384	4.2
Sodium fluoride	6.1, 65°(c)	60	1690	6.1A
Sodium hydrogen sulphide, aqueous solutions of	8, 45 (c)	80	2949	8
Sodium hydrogen sulphide with not less than 25% water of crystallization	8, 45°(b)	80	2949	8
Sodium hydrosulphide, with less than 25% water of crystallization	4.2, 13 (b)	40	2318	4.2
Sodium hydroxide (Caustic soda)	8, 41°(b)	80	1823	8
Sodium hydroxide, solutions of (Soda lye)	8, 42°(b)	80	1824	8
Sodium methylate	4.2, 15°(b)	48	1431	4.2 + 8
Sodium methylate, alcoholic solutions of	3, 24°(b)	338	1289	3 + 8
Sodium nitrate	5.1, 22°(c)	50	1498	5.1

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Sodium nitrate and potassium nitrate mixtures	5.1, 22°(c)	50	1499	5.1
Sodium nitrite	5.1, 23°(c)	50	1500	5.1
Sodium oxide	8, 41°(b)	80	1825	8
Sodium pentachlorophenate	6.1, 17°(b)	60	2567	6.1
Sodium percarbonates	5.1, 19°(c)	50	2467	5.1
Sodium perchlorate	5.1, 13°(b)	50	1502	5.1
Sodium permanganate	5.1, 17°(b)	50	1503	5.1
Sodium peroxoborate	5.1, 27°(b)	50	3247	5.1
Sodium persulphate	5.1, 18°(c)	50	1505	5.1
Sodium sulphide, anhydrous	4.2, 13°(b)	40	1385	4.2
Sodium sulphide, aqueous solutions of	8, 45°(c)	80	1849	8
Sodium sulphide with less than 30% water of crystallization	4.2, 13°(b)	40	1385	4.2
Sodium sulphide with not less than 30% water of crystallization	8, 45°(b)	80	1849	8
Stannic chloride, anhydrous ($SnCl_4$)	8, 21°(b)	80	1827	8
Stannic chloride pentahydrate ($SnCl_4.5H_2O$)	8, 22°(c)	80	2440	8
Strontium chlorate	5.1, 11°(b)	50	1506	5.1
Strontium nitrate	5.1, 22°(c)	50	1507	5.1
Strontium perchlorate	5.1, 13°(b)	50	1508	5.1
Strontium peroxide	5.1, 25°(b)	50	1509	5.1
Styrene (Vinylbenzene)	3, 31°(c)	39	2055	3
Sulphur	4.1, 11°(c)	40	1350	4.1
Sulphur, molten	4.1, 15°	44	2448	4.1
Sulphur dichloride (SCl_2)	8, 21°(a)	X88	1828	8
Sulphur dioxide	2, 3°(at)	26	1079	6.1
Sulphur hexafluoride	2, 5°(a)	20	1080	2
Sulphuric acid	8, 1°(b)	80	1830	8
Sulphuric acid, fuming: see Oleum				
Sulphuric acid, mixtures with nitric acid: see Mixtures of sulphuric acid and nitric acid				
Sulphuric acid, waste	8, 1°(b)	80	1832	8
Sulphurous acid	8, 1°(b)	80	1833	8
Sulphur trioxide	8, 1°(a)	X88	1829	8
Sulphuryl chloride (SO_2Cl_2)	8, 21°(a)	X88	1834	8
Tars, liquid	3, 32°(c)	30	1999	-
Terpinolene	3, 31°(c)	30	2541	3
1,1,2,2-Tetrabromoethane (Acetylene tetrabromide)	6.1, 17°(c)	60	2504	6.1A
1,1,2,2-Tetrachloroethane (Acetylene tetrachloride)	6.1, 15°(b)	60	1702	6.1
Tetrachloroethylene (Perchloroethylene)	6.1, 15°(c)	60	1897	6.1A
Tetrachlorophenols	6.1, 17°(c)	60	2020	6.1A
Tetraethylenepentamine	8, 53°(c)	80	2320	8
Tetraethyl lead	6.1, 31°(a)	66	1649	6.1
Tetraethyl silicate	3, 31°(c)	30	1292	3
1,1,1,2-Tetrafluorethane (R 134a)	2, 3°(a)	20	3159	2
1,2,3,6-Tetrahydrobenzaldehyde	3, 32°(c)	30	2498	-

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Tetrahydrofuran	3, 3°(b)	33	2056	3
Tetrahydrofurfurylamine	3, 31°(c)	30	2943	3
Tetrahydrophthalic anhydride	8, 31°(c)	80	2698	8
1,2,3,6-Tetrahydropyridine	3, 3°(b)	33	2410	3
Tetrahydrothiophene	3, 3°(b)	33	2412	3
Tetramethoxysilane: see Methyl orthosilicate				
Tetramethylammonium hydroxide	8, 51°(b)	80	1835	8
Tetramethylethylenediamine: see 1,2-Bis (dimethylamino) ethane				
Tetramethyl lead	6.1, 31°(a)	663	1649	6.1 + 3
Tetramethylsilane	3, 1°(a)	33	2749	3
Tetranitromethane	5.1, 2°	559	1510	5.1+ 6.1
Tetrapropylene (Propylene tetramer)	3, 32°(c)	30	2850	-
Tetrapropylorthotitanate	3, 31°(c)	30	2413	3
Thallium chlorate	5.1, 29°(b)	56	2573	5.1+ 6.1
4-Thiapentanal	6.1, 20°(c)	60	2785	6.1A
Thioacetic acid	3, 3°(b)	33	2436	3
Thioglycol: see Mercaptoethanol				
Thioglycolic acid	8, 32°(b)	80	1940	8
Thiolactic acid	6.1, 21°(b)	60	2936	6.1
Thionyl chloride ($SOCl_2$)	8, 21°(a)	X88	1836	8
Thiophene	3, 3°(b)	33	2414	3
Thiophenol	6.1, 20°(a)	663	2337	6.1 + 3
Thiophosgene	6.1, 20°(b)	60	2474	6.1
Thiophosphoryl chloride ($PSCl_3$)	8, 21°(b)	80	1837	8
Tinctures, medicinal				
- with a flash-point below 21°C	3, 3°(b)	33	1293	3
- with a flash-point between 21°C and 55° C	3, 31°(c)	30	1293	3
- with a flash-point above 55°C	3, 32°(c)	30	1293	-
Titanium disulphide	4.2, 13°(c)	40	3174	4.2
Titanium hydride	4.1, 14°(b)	40	1871	4.1
Titanium powder, wetted	4.1, 13°(b)	40	1352	4.1
Titanium powder, dry	4.2, 12°(b) 4.2, 12°(c)	40 40	2546 2546	4.2 4.2
Titanium sponge granules	4.1, 13°(c)	40	2878	4.1
Titanium sponge powders	4.1, 13°(c)	40	2878	4.1
Titanium tetrachloride ($TiCl_4$)	8, 21°(b)	80	1838	8
Titanium trichloride, mixtures of, non-pyrophoric	8, 22°(b)	80	2869	8
Toluene	3, 3°(b)	33	1294	3
Toluene sulphonic acids, solid	8, 34°(c)	80	2585	8
Toluene sulphonic acids, solutions of	8, 34°(c)	80	2586	8
Toluidines	6.1, 12°(b)	60	1708	6.1
2,4-Toluylenediamine	6.1, 12°(c)	60	1709	6.1A
2,4-Toluylene diisocyanate and isomeric mixtures	6.1, 19°(b)	60	2078	6.1
Tremolite: see White asbestos				

Name of substance (a)	Class and item *number* (b)	Hazard Identification No. *(upper part)* (c)	Substance Identification No. *(lower part)* (d)	Label (e)
Triallylamine	3, 31°(c)	30	2610	3
Triallyl borate	6.1, 13°(c)	60	2609	6.1A
Tributylamine	8, 53°(c)	80	2542	8
Trichloroacetaldehyde (Chloral)	6.1, 16°(b)	60	2075	6.1
Trichloroacetic acid	8, 31°(b)	80	1839	8
Trichloroacetic acid, solutions of	8, 32°(b)	80	2564	8
Trichloroacetyl chloride	8, 36°(b)	X80	2442	8
Trichlorobenzenes	6.1, 17°(c)	60	2321	6.1A
Trichlorobutene	6.1, 17°(b)	60	2322	6.1
1,1,1-Trichloroethane	6.1, 15°(c)	60	2831	6.1A
Trichloroethylene	6.1, 15°(c)	60	1710	6.1A
Trichloroisocyanuric acid	5.1, 26°(b)	50	2468	5.1
Trichloromethylbenzene: see Benzotrichloride				
Trichlorophenols	6.1, 17°(c)	60	2020	6.1A
Trichlorosilane	4.3, 1°(a)	X338	1295	4.3 + 3 + 8
Tricresylphosphate with more than 3% ortho isomer	6.1, 23°(b)	60	2574	6.1
Triethylamine	3, 22°(b)	338	1296	3 + 8
Triethyl borate	3, 3°(b)	33	1176	3
Triethylenetetramine	8, 53°(b)	80	2259	8
Triethyl phosphite	3, 31°(c)	30	2323	3
Trifluoroacetic acid	8, 32°(a)	88	2699	8
Trifluorochloroethylene (R 1113)	2, 3°(ct)	236	1082	3 +6.1
1,1,1-Trifluoroethane	2, 3°(b)	23	2035	3
Trifluoromethane (R 23)	2, 5°(a)	20	1984	2
2-Trifluoromethylaniline	6.1, 16°(c)	60	2942	6.1A
3-Trifluoromethylaniline	6.1, 16°(b)	60	2948	6.1
Triisobutylene (Isobutylene trimer)	3, 31°(c)	30	2324	3
Triisocyanatoisocyanurate of isophorone-diisocyanate, solutions of	3, 31°(c)	30	2906	3
Triisopropyl borate, pure	3, 31°(c)	30	2616	3
Triisopropyl borate, technical	3, 3°(b)	33	2616	3
Trimethyl acetyl chloride: see Pivaloyl chloride				
Trimethylamine, anhydrous	2, 3°(bt)	236	1083	3 + 6.1
Trimethylamine, aqueous solutions of - having a boiling point not more than 35°C - having a boiling point higher than 35°C	 3, 22°(a) 3, 22°(b)	 338 338	 1297 1297	 3 + 8 3 + 8
1,3,5-Trimethylbenzene: see Mesitylene				
Trimethyl borate	3, 3°(b)	33	2416	3
Trimethylchlorosilane	3, 21°(a)	X338	1298	3 + 8
Trimethylcyclohexylamine	8, 53°(c)	80	2326	8
Trimethylhexamethylenediamines	8, 53°(c)	80	2327	8
Trimethylhexamethylene diisocyanate and isomeric mixtures	6.1, 19°(c)	60	2328	6.1A
Trimethyl phosphite	3, 31°(c)	30	2329	3
Tripropylamine	8, 53°(b)	83	2260	8 + 3
Tripropylene (Propylene trimer)	3, 31°(c)	30	2057	3

Name of substance (a)	Class and item number (b)	Hazard identification No. (upper part) (c)	Substance identification No. (lower part) (d)	Label (e)
Turpentine	3, 31°(c)	30	1299	3
Turpentine substitute: see Hydrocarbons, liquid				
Undecane	3, 32°(c)	30	2330	-
Uranyl nitrate hexahydrate	7, Sch 5 or 6	78	2980	7A, 7B or 7C + 8
Urea hydrogen peroxide	5.1, 31°(c)	58	1511	5.1+8
Valeraldehyde	3, 3°(b)	33	2058	3
Valeryl chloride	8, 36°(b)	80	2502	8
Vanadium oxytrichloride ($VOCl_3$)	8, 21°(b)	80	2443	8
Vanadium oxytrichloride ($VOCl_3$), aqueous solutions of	8, 5°(b)	80	2443	8
Vanadium pentoxide	6.1, 58°(b)	60	2862	6.1
Vanadium tetrachloride (VCl_4)	8, 21°(a)	88	2444	8
Vanadium trichloride (VCl_3)	3, 22°(c)	80	2475	8
Varnishes				
- having a flash-point below 21°C	3, 5°	33	1263	3
- having a flash-point between 21°C and 55°C (limit values included)	3, 31°(c)*/	30	1263	3
- having a flash-point above 55°C	3, 32°(c)*/	30	1263	-
Vinyl acetate	3, 3°(b)	339	1301	3
Vinylbenzene: see Styrene				
Vinyl bromide	2, 3°(ct)	236	1085	3 + 6.1
Vinyl butyrate	3, 3°(b)	339	2838	3
Vinyl chloride	2, 3°(c)	239	1086	3
Vinyl chloroacetate	6.1, 16°(b)	60	2589	6.1
Vinyl ethyl ether	3, 2°(b)	339	1302	3
Vinyl fluoride	2, 5°(c)	239	1860	3
Vinylidene chloride	3, 1°(a)	339	1303	3
Vinylidene fluoride: see 1,1-Difluoroethylene				
Vinyl isobutyl ether	3, 3°(b)	339	1304	3
Vinyl pyridines	6.1, 11°(b)	639	3073	6.1 + 3
Vinyl toluene, mixed isomers	3, 31°(c)	39	2618	3
Vinyltrichlorosilane	3, 21°(a)	X338	1305	3 + 8
White arsenic: see Arsenic trioxide				
White asbestos (Actinolite, Anthophyllite, Chrysotile or Tremolite)	9, 1°(c)	90	2590	9
White spirit: see Hydrocarbons, liquid				
Wood preservatives				
- with a flash-point below 21°C	3, 3°(b)	33	1306	3
- with a flash-point between 21°C and 55°C	3, 31°(c)	30	1306	3
- with a flash-point above 55°C	3, 32°(c)	30	1306	-
Xenon	2, 5°(a)	20	2036	2
Xenon, liquid, deeply refrigerated	2, 7°(a)	22	2591	2
Xylenes (Dimethylbenzenes)	3, 31°(c)	30	1307	3
Xylenols	6.1, 14°(b)	60	2261	6.1
Xylidines	6.1, 12°(b)	60	1711	6.1
Xylyl bromide	6.1, 17°(b)	60	1701	6.1

*/ See, however, NOTE under section D of marginal 2301.

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Zinc ammonium nitrite	5.1, 23°(b)	50	1512	5.1
Zinc ashes	4.3, 13°(c)	423	1435	4.3
Zinc bromate	5.1, 16°(c)	50	2469	5.1
Zinc chlorate	5.1, 11°(b)	50	1513	5.1
Zinc chloride ($ZnCl_2$)	8, 22°(c)	80	2331	8
Zinc chloride ($ZnCl_2$), aqueous solutions of	8, 5°(c)	80	1840	8
Zinc dust	4.3, 14° (b) 4.3, 14° (c)	423 423	1436 1436	4.3 + 4.2 4.3 + 4.2
Zinc nitrate	5.1, 22°(b)	50	1514	5.1
Zinc permanganate	5.1, 17°(b)	50	1515	5.1
Zinc peroxide	5.1, 25°(b)	50	1516	5.1
Zinc powder	4.3, 14°(b) 4.3, 14°(c)	423 423	1436 1436	4.3 + 4.2 4.3 + 4.2
Zinc resinate	4.1, 12°(c)	40	2714	4.1
Zirconium hydride	4.1, 14°(b)	40	1437	4.1
Zirconium nitrate	5.1, 22°(c)	50	2728	5.1
Zirconium powder, wetted	4.1, 13°(b)	40	1358	4.1
Zirconium powder, dry	4.2, 12°(b) 4.2, 12°(c)	40 40	2008 2008	4.2 4.2
Zirconium scrap	4.2, 12°(c)	40	1932	4.2
Zirconium tetrachloride ($ZrCl_4$)	8, 22°(c)	80	2503	8

250 000 (cont'd) Table II

Should be read as follow:

List of collectives headings or n.o.s. entries which are not listed by name,or which do not fall under a collective heading in Table I.

This table includes two types of collective headings or n.o.s. entries:

- specific collective headings or n.o.s. entries applicable to groups of chemical compounds of the same type;

- general collective headings or n.o.s. entries applicable to groups of substances which present similar primary and secondary hazards.

Substances may only be classified under a general collective heading or n.o.s. entry if they cannot be classified under a specific collective heading or n.o.s. entry.

NOTE: This table applies only to substances not included in Table I.

Group of substances (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Class 3 : *Flammable liquids*				
SPECIFIC COLLECTIVE HEADINGS				
Aldehydes, not otherwise specified in this Appendix				
- having a flash-point below 21°C	3, 3°(b)	33	1989	3
- having a flash-point between 21°C and 55°C (limit values included)	3, 31°(c)	30	1989	3
- having a flash-point above 55°C	3, 32°(c)	30	1989	-
Ketones, liquid, not otherwise specified in this appendix				
- with a flash-point below 21°C	3, 3°(b)	33	1224	3
- with a flash-point between 21°C and 55°C	3, 31°(c)	30	1224	3
- with a flash-point above 55°C	3, 32°(c)	30	1224	-
Isocyanates, solutions of, having a flash-point below 21°C	3, 14°(b)	336	2478	3 + 6.1
Mercaptans, not otherwise specified in this appendix				
- with a flash-point below 21°C, highly toxic	3, 18°(a)	336	1228	3 + 6.1
- with a flash-point below 21°C, toxic	3, 18°(a)	336	1228	3 + 6.1
- with a flash-point below 21°C, harmful or non-toxic	3, 3°(b)	33	1228	3
Chlorosilanes which do not give off flammable gases on contact with water, not otherwise specified in this Appendix				
- having a flash-point below 21°C	3, 21°(a)	X338	2985	3 + 8
Alkylamines and polyamines, not otherwise specified in this appendix				
- with a flash-point below 21°C, highly corrosive	3, 22°(a)	338	2733	3 + 8
- with a flash-point below 21°C, corrosive	3, 22°(b)	338	2733	3 + 8
- with a flash-point below 21°C, slightly corrosive	3, 3°(b)	33	2733	3
Terpene hydrocarbons, not otherwise specified in this Appendix				
- having a flash-point between 21°C and 55°C (limit values included)	3, 31°(c)	30	2319	3
- having a flash-point above 55°C	3, 32°(c)	30	2319	-

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(cont'd)

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Alcohols, liquid, non-toxic, pure or in mixtures, not otherwise specified in this Appendix				
- having a flash-point between 21°C and 55°C (limit values included)	3, 31°(c)	30	1987	3
- having a flash-point above 55°C	3, 32°(c)	30	1987	-
GENERAL COLLECTIVE HEADINGS				
Flammable liquids having a flash-point below 21°C, not toxic and not corrosive	3, 1°, 5°	33	1993	3
Flammable liquid substances and preparations used as pesticides, having a flash-point below 21°C, harmful	3, 6°	33	3021	3 + 6.1A
Flammable liquids having a flash-point below 21°C, toxic	3, 11°-14° 18°, 20°	336	1992	3 + 6.1
Flammable liquid substances and preparations used as pesticides, having a flash-point below 21°C, highly toxic or toxic	3, 19°	336	3021	3 + 6.1
Flammable liquids having a flash-point below 21°C, corrosive	3, 22°-26°	338	2924	3 + 8
Flammable liquids having a flash-point between 21°C and 100°C, not toxic and not corrosive	3, 31° 3, 32°	30 30	1993 1993	3 -
Class 4.1: Flammable solids				
SPECIFIC N.O.S. ENTRIES				
Metal hydrides, flammable, N.O.S.	4.1, 14°(b) 4.1, 14°(c)	40 40	3182 3182	4.1 4.1
GENERAL N.O.S. ENTRIES				
Flammable solid, organic, molten, N.O.S.	4.1, 5°	44	3176	4.1
Flammable solid, organic, N.O.S.	4.1, 6° (b) 4.1, 6° (c)	40 40	1325 1325	4.1 4.1
Flammable solid, organic, toxic, N.O.S.	4.1, 7° (b) 4.1, 7° (c)	46 46	2926 2926	4.1 + 6.1 4.1 + 6.1
Flammable solid, organic, corrosive, N.O.S.	4.1, 8° (b) 4.1, 8° (c)	48 48	2925 2925	4.1 + 8 4.1 + 8
Flammable solid, inorganic, N.O.S.	4.1, 11° (b) 4.1, 11° (c)	40 40	3178 3178	4.1 4.1
Metal salts of organic compounds, flammable, N.O.S.	4.1, 12° (b) 4.1, 12° (c)	40 40	3181 3181	4.1 4.1
Metal powders, flammable, N.O.S.	4.1, 13° (b) 4.1, 13° (c)	40 40	3089 3089	4.1 4.1
Flammable solid, inorganic, toxic, N.O.S.	4.1, 16° (b) 4.1, 16° (c)	46 46	3179 3179	4.1 + 6.1 4.1 + 6.1
Flammable solid, inorganic, corrosive, N.O.S.	4.1, 17° (b) 4.1, 17° (c)	48 48	3180 3180	4.1 + 8 4.1 + 8
Class 4.2.: Substances liable to spontaneous combustion				
SPECIFIC N.O.S. ENTRIES:				
Alkaline earth metal alcoholates, N.O.S.	4.2, 14° (b) 4.2, 14° (c)	40 40	3205 3205	4.2 4.2
Alkali metal alcoholates, N.O.S.	4.2, 15° (b) 4.2, 15° (c)	48 48	3206 3206	4.2 + 8 4.2 + 8
Metal alkyls, N.O.S. or Metal aryl N.O.S.	4.2, 31° (a)	X333	2003	4.2 + 4.3

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Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Metal alkyl halides, N.O.S. or Metal aryl halides N.O.S.	4.2, 32° (a)	X333	3049	4.2 + 4.3
Metal alkyl hydrides, N.O.S. or Metal aryl hydrides, N.O.S.	4.2, 32° (a)	X333	3050	4.2 + 4.3
GENERAL N.O.S. ENTRIES				
Self-heating solid, organic, N.O.S.	4.2, 5° (b)	40	3088	4.2
	4.2, 5° (c)	40	3088	4.2
Pyrophoric liquid, organic, N.O.S.	4.2, 6° (a)	333	2845	4.2
Self-heating liquid, organic N.O.S.	4.2, 6° (b)	30	3183	4.2
	4.2, 6° (c)	30	3183	4.2
Self-heating solid, organic, toxic, N.O.S.	4.2, 7° (b)	46	3128	4.2 + 6.1
	4.2, 7° (c)	46	3128	4.2 + 6.1
Self-heating liquid, organic, toxic, N.O.S.	4.2, 8° (b)	36	3184	4.2 + 6.1
	4.2, 8° (c)	36	3184	4.2 + 6.1
Self-heating solid, organic, corrosive, N.O.S.	4.2, 9° (b)	48	3126	4.2 + 8
	4.2, 9° (c)	48	3126	4.2 + 8
Self-heating liquid, organic, corrosive, N.O.S.	4.2, 10° (b)	38	3185	4.2 + 8
	4.2, 10° (c)	38	3185	4.2 + 8
Self-heating metal powders, N.O.S.	4.2, 12° (b)	40	3189	4.2
	4.2, 12° (c)	40	3189	4.2
Self-heating solid, inorganic N.O.S.	4.2, 16° (b)	40	3190	4.2
	4.2, 16° (c)	40	3190	4.2
Pyrophoric liquid, inorganic, N.O.S.	4.2, 17° (a)	333	3194	4.2
Self-heating liquid, inorganic, N.O.S.	4.2, 17° (b)	30	3186	4.2
	4.2, 17° (c)	30	3186	4.2
Self-heating solid, inorganic, toxic, N.O.S.	4.2, 18° (b)	46	3191	4.2 + 6.1
	4.2, 18° (c)	46	3191	4.2 + 6.1
Self-heating liquid, inorganic, toxic, N.O.S.	4.2, 19° (b)	36	3187	4.2 + 6.1
	4.2, 19° (c)	36	3187	4.2 + 6.1
Self-heating solid, inorganic, corrosive, N.O.S.	4.2, 20° (b)	48	3192	4.2 + 8
	4.2, 20° (c)	48	3192	4.2 + 8
Self-heating liquid, inorganic, corrosive, N.O.S.	4.2, 21° (b)	38	3188	4.2 + 8
	4.2, 21° (c)	38	3188	4.2 + 8
Pyrophoric organometallic compounds, N.O.S.	4.2, 33° (a)	X333	3202	4.2 + 4.3
Class 4.3 Substances, which, in contact with water, emit flammable gases				
SPECIFIC N.O.S. ENTRIES				
Chlorosilanes, N.O.S.	4.3, 1° (a)	X338	2988	4.3 + 3 + 8
Alkali metal alloys, liquid, N.O.S.	4.3 11° (a)	X423	1421	4.3
Alkaline earth metal alloys, N.O.S.	4.3, 11° (b)	423	1393	4.3
Metal hydrides, water reactive, N.O.S.	4.3, 16° (b)	423	1409	4.3
GENERAL N.O.S. ENTRIES				
Organometallic compounds, or solutions, or dispersions, water-reactive, flammable, N.O.S.	4.3, 3° (a)	X323	3207	4.3 + 3
	4.3, 3° (b)	323	3207	4.3 + 3
	4.3, 3° (c)	323	3207	4.3 + 3
Metallic substances, water-reactive N.O.S.	4.3, 13° (b)	423	3208	4.3
	4.3, 13° (c)	423	3208	4.3

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Name of substance (a)	Class and item number (b)	Hazard identification No. (upper part) (c)	Substance identification No. (lower part) (d)	Label (e)
Metallic substances, water-reactive, self-heating N.O.S.	4.3, 14° (b)	423	3209	4.3 + 4.2
	4.3, 14° (c)	423	3209	4.3 + 4.2
Water-reactive solid, N.O.S.	4.3, 20° (b)	423	2813	4.3
	4.3, 20° (c)	423	2813	4.3
Water-reactive liquid, N.O.S.	4.3, 21° (a)	X323	3148	4.3
	4.3, 21° (b)	323	3148	4.3
	4.3, 21° (c)	323	3148	4.3
Water-reactive solid, toxic, N.O.S.	4.3, 22° (b)	462	3134	4.3 + 6.1
	4.3, 22° (c)	462	3134	4.3 + 6.1
Water-reactive liquid, toxic, N.O.S.	4.3, 23° (a)	362	3130	4.3 + 6.1
	4.3, 23° (b)	362	3130	4.3 + 6.1
	4.3, 23° (c)	362	3130	4.3 + 6.1
Water-reactive solid, corrosive, N.O.S.	4.3, 24° (b)	482	3131	4.3 + 8
	4.3, 24° (c)	482	3131	4.3 + 8
Water-reactive liquid, corrosive, N.O.S.	4.3, 25° (a)	382	3129	4.3 + 8
	4.3, 25° (b)	382	3129	4.3 + 8
	4.3, 25° (c)	382	3129	4.3 + 8
Class 5.1: Oxidizing substances				
SPECIFIC N.O.S. ENTRIES				
Chlorates, inorganic, N.O.S.	5.1, 11° (b)	50	1461	5.1
Chlorates, inorganic, aqueous, solutions, N.O.S.	5.1, 11° (b)	50	3210	5.1
Perchlorates, inorganic, N.O.S.	5.1, 13° (b)	50	1481	5.1
Perchlorates inorganic, aqueous solutions, N.O.S.	5.1, 13° (b)	50	3211	5.1
Chlorites, inorganic, N.O.S.	5.1, 14° (b)	50	1462	5.1
Hypochlorites, inorganic, N.O.S.	5.1, 15° (b)	50	3212	5.1
Bromates, inorganic, N.O.S.	5.1, 16° (b)	50	1450	5.1
Bromates, inorganic, aqueous solutions, N.O.S.	5.1, 16° (b)	50	3213	5.1
	5.1, 16° (c)	50	3213	5.1
Permanganates, inorganic, N.O.S.	5.1, 17° (b)	50	1482	5.1
Permanganates, inorganic, aqueous solutions,N.O.S.	5.1, 17° (b)	50	3214	5.1
Persulphates, inorganic, N.O.S.	5.1, 18° (c)	50	3215	5.1
Persulphates, inorganic, aqueous solutions, N.O.S.	5.1, 18° (c)	50	3216	5.1
Percarbonates, inorganic, N.O.S.	5.1, 19° (c)	50	3217	5.1
Nitrates, inorganic, N.O.S.	5.1, 22° (b)	50	1477	5.1
Nitrates, inorganic, aqueous solutions, N.O.S.	5.1, 22° (b)	50	3218	5.1
	5.1, 22° (c)	50	3218	5.1
Nitrates, inorganic, N.O.S.	5.1, 23° (b)	50	2627	5.1
Nitrates, inorganic, aqueous solutions, N.O.S.	5.1, 23° (b)	50	3219	5.1
	5.1. 23° (c)	50	3219	5.1
Peroxides, inorganic, N.O.S.	5.1, 25° (b)	50	1483	5.1
GENERAL N.O.S. ENTRIES:				
Oxidizing substances, solid, N.O.S.	5.1, 27° (b)	50	1479	5.1
	5.1, 27° (c)	50	1479	5.1
Oxidizing solid, toxic, N.O.S.	5.1, 29° (b)	56	3087	5.1 + 6.1
	5.1, 29° (c)	56	3087	5.1 + 6.1

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Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Oxidizing solid, corrosive, N.O.S.	5.1, 31° (b) 5.1, 31° (c)	58 58	3085 3085	5.1 + 8 5.1 + 8
Class 6.1: Toxic Substances				
SPECIFIC COLLECTIVE HEADINGS				
Alkyl phenols, with C_2–C_8 chains, not otherwise specified in this Appendix	6.1, 14°(c)	60	3145	6.1A
Isocyanates, not otherwise specified in this appendix				
- with a flash-point between 21°C and 55°C and a boiling point below 200°C	6.1, 18°(b)	63	3080	6.1 + 3
- with a flash-point between 21°C and 55°C and a boiling point between 200°C and 300°C	6.1, 19°(b)	63	3080	6.1 + 3
- with a flash-point above 55°C and a boiling point below 200°C	6.1, 18°(b)	60	2206	6.1
- with a flash-point above 55°C and a boiling point between 200°C and 300° C	6.1, 19°(b)	60	2206	6.1
- with a flash-point above 55°C and a boiling point of 300°C or over	6.1, 19° (c)	60	2207	6.1A
Mercaptans, not otherwise specified in this appendix				
- with a flash-point between 21°C and 55°C, highly toxic	6.1, 20°(a)	663	3071	6.1 + 3
- with a flash-point between 21°C and 55°C, toxic	6.1, 20°(b)	63	3071	6.1 + 3
- with a flash-point between 21°C and 55°C, harmful	6.1, 20°(c)	63	3071	6.1A + 3
Cyanides, inorganic solutions of, not otherwise specified in this Appendix	6.1, 41°(a)	66	1935	6.1
Arsenical compounds, liquid, inorganic, not otherwise specified in this Appendix	6.1, 51°(a)	66	1556	6.1
Lead compounds, not otherwise specified in this Appendix	6.1, 62°(c)	60	2291	6.1A
GENERAL COLLECTIVE HEADINGS				
Highly toxic halogenated liquids, irritant, flammable, with a flash-point between 21°C and 55°C	6.1, letter (a) of items 15° and 16°	663	1610	6.1 + 3
Toxic halogenated liquids, irritant, flammable with a flash-point between 21°C and 55°C	6.1, letter (b) of items 15° and 16°	63	1610	6.1 +3
Highly toxic halogenated liquids, irritant, non flammable or with a flash-point above 55°C	6.1, letter (a) of items 15°–17°	66	1610	6.1
Toxic halogenated liquids, irritant, non-flammable or with a flash-point above 55°C	6.1, letter (b) of items 15°–17°	60	1610	6.1

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(cont'd)

Name of substance (a)	Class and item number (b)	Hazard identification No. (upper part) (c)	Substance identification No. (lower part) (d)	Label (e)
Highly toxic liquids, flammable, having a flash-point between 21°C and 55°C	6.1, letter (a) of items 11°, 13°, 15° 16°, 18°, 20° 22°, 24°, 68°	663	2929	6.1 + 3
Toxic liquids, flammable, having a flash-point between 21°C and 55°C	6.1, letter (b) of items 11°, 13°, 15° 16°, 18°, 20° 22°, 24°, 68°	63	2929	6.1 + 3
Harmful liquids, flammable, having a flash-point between 21°C and 55°C	6.1, letter (c) of items 11°, 13°, 15° 16°, 18°, 20° 22°, 24°, 68°	63	2929	6.1A + 3
Highly toxic liquids, non-flammable or having a flash-point above 55°C	6.1, letter (a) of items 11°-24°, 55° 68°	66	2810	6.1
Toxic liquids, non-flammable or having a flash-point above 55°C	6.1, letter (b) of items 11°-24°, 51° 55°, 57°-61°, 63°-66°, 68°	60	2810	6.1
Harmful liquids, non-flammable or having a flash-point above 55°C	6.1, letter (c) of items 11°-24°, 51°-55°, 57°-61°, 63°-66°, 68°	60	2810	6.1A
Toxic solids, combustible	6.1, letter (b) of items 11°-24°, 68°	60	2930	6.1
Harmful solids, combustible	6.1, letter (c) of items 11°-24°, 68°	60	2930	6.1A
Toxic solids, not-combustible	6.1, letter (b) of items 24°-51°-55°, 57°-61°, 63° 66°, 68°	60	2811	6.1
Harmful solids, not combustible	6.1, letter (c) of items 24°, 51°-55°, 57°-61°, 63°-66°, 68°	60	2811	6.1A
Highly toxic liquid substances and preparations *used as pesticides*, flammable, having a flash-point between 21°C and 55°C	6.1, letter (a) of items 74°, 75°, 77°, 78°, 80°, 81° 83°, 85°, 88°	663	2903	6.1 + 3

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(cont'd)

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Toxic liquid substances and preparations used as pesticides, flammable, having a flash-point between 21°C and 55°C	6.1, letter (b) of items 74°, 75°, 77°, 78°, 80°, 81° 83°, 85°, 88°	63	2903	6.1 + 3
Harmful liquid substances and preparations used as pesticides, flammable, having a flash-point between 21°C and 55°C	6.1, letter (c) of items 74°, 75°, 77°, 78°, 80°, 81° 83°, 85°, 88°	63	2903	6.1A + 3
Highly toxic liquid substances and preparations used as pesticides, non-flammable or having a flash-point above 55°C	6.1, letter (a) of items 74°, 75°, 77°, 78°, 80°, 81° 83°, 85°, 88°	66	2902	6.1
Toxic liquid substances and preparations used as pesticides, non-flammable or having a flash-point above 55°C	6.1, letter (b) of items 74°, 75°, 77°, 78°, 80°, 81° 83°, 85°, 88°	60	2902	6.1
Harmful liquid substances and preparations used as pesticides, non-flammable or having a flash-point above 55°C	6.1, letter (c) of items 74°, 75°, 77°, 78°, 80°, 81° 83°, 85°, 88°	60	2902	6.1A
Toxic solid substances and preparations used as pesticides	6.1, letter (b) of items 74°, 75°, 77°, 78°, 80°, 81° 83°, 85°, 88°	60	2588	6.1
Harmful solid substances and preparations used as pesticides	6.1, letter (c) of items 74°, 75°, 77°, 78°, 80°, 81° 83°, 85°, 88°	60	2588	6.1A
Class 7: Radioactive material				
SPECIFIC COLLECTIVE HEADINGS				
Radioactive material, low specific activity (LSA), not otherwise specified in this Appendix	7, Sch 5 or 6	70	2912	7A, 7B or 7C
gas		72	2912	7A, 7B or 7C
gas flammable		723	2912	7A, 7B or 7C + 3
liquid, flammable, having a flash point not above 55°C		73	2912	7A, 7B or 7C + 3
solid, flammable		74	2912	7A, 7B or 7C + 4.1
oxidizing		75	2912	7A, 7B or 7C + 05

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(cont'd)

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
(cont'd) toxic		76	2912	7A, 7B or 7C + 6.1
harmful		70	2912	7A, 7B or 7C + 6.1A
corrosive		78	2912	7A, 7B or 7C + 8
GENERAL COLLECTIVE HEADINGS				
Radioactive material, not otherwise specified in this Appendix	7, Sch, 9, 10 and 11	70	2982	7A, 7B or 7C
gas		72	2982	7A, 7B or 7C
gas flammable		723	2982	7A, 7B or 7C + 3
liquid, flammable, having a flash point not above 55°C		73	2982	7A, 7B or 7C + 3
solid, flammable		74	2982	7A, 7B or 7C + 4.1
oxidizing		75	2982	7A, 7B or 7C + 05
toxic		76	2982	7A, 7B or 7C + 6.1
harmful		70	2982	7A, 7B or 7C + 6.1A
corrosive		78	2982	7A, 7B or 7C + 8
Class 8: Corrosive substances				
SPECIFIC COLLECTIVE HEADINGS				
Alkyl sulphonic acids, not otherwise specified in this Appendix				
- with more than 5 % free sulphuric acid,	8, 1°(b)	80	2584	8
- with not more than 5 % free sulphuric acid, corrosive	8, 34°(b)	80	2586	8
- with not more than 5 % free sulphuric acid, slightly corrosive	8, 34°(c)	80	2586	8
Aryl sulphonic acids, not otherwise specified in this Appendix				
- with more than 5 % free sulphuric acid	8, 1°(b)	80	2584	8
- with not more than 5 % free sulphuric acid, corrosive	8, 34°(b)	80	2586	8
- with not more than 5 % free sulphuric acid, slightly corrosive	8, 34°(c)	80	2586	8
Chlorosilanes which do not give off flammable gases on contact with water, not otherwise specified in this Appendix				
- having a flash-point between 21°C and 55°C (limit values included)	8, 37°(b)	X83	2986	8 + 3
- having a flash-point above 55°C	8, 37°(b)	X80	2987	8

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Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Alkaline inorganic substances, solutions of, not otherwise specified in this Appendix				
- corrosive	8, 42°(b)	80	1719	8
- slightly corrosive	8, 42°(c)	80	1719	8
Hydrogen sulphides, aqueous solutions of, not otherwise specified in this Appendix	8, 45°(c)	80	1719	8
Sulphides, aqueous solutions of, not otherwise specified in this Appendix	8, 45°(c)	80	1719	8
Alkylamines and polyamines, not otherwise specified in this appendix				
- with a flash-point between 21°C and 55°C, corrosive	8, 53°(b)	83	2734	8 + 3
- with a flash-point between 21°C and 55°C, slightly corrosive	8, 53°(c)	83	2734	8 + 3
- with a flash-point above 55°C, corrosive	8, 53°(b)	80	2735	8
- with a flash-point above 55°C, slightly corrosive	8, 53°(c)	80	2735	8
- solid	8, 52°(c)	90	2735	8
GENERAL COLLECTIVE HEADINGS				
Highly corrosive liquids, flammable, having a flash-point between 21°C and 55°C	8, letters (a) of items 27°, 32°, 33°, 36°, 37°, 39°, 46°, 55°, 64°, 66°	983	2920	8 + 3
Corrosive or slightly corrosive liquids, flammable, having a flash-point between 21°C and 55°C	8, letters (b) and (c) of items 27°, 32°, 33°, 36°, 38°, 39°,46°, 51°, 53°, 55°, 64°, 66°	83	2920	8+ 3
Highly corrosive liquids, non-flammable or having a flash-point above 55°C	8, letters (a) of items 1°, 3°, 10°, 11°, 21°,27°, 32°, 33°, 36°, 37°, 39°, 46°			
	55°, 64°, 66°	88	1760	8
	8°, 26°(a)	88	1760	8 + 6.1
Corrosive or slightly corrosive liquids, non-flammable or having a flash-point above 55°C	8, letters (b) and (c) of items 1°, 3°, 5°, 10° 11°, 21°, 23° 27°, 32°, 33° 36°, 38°, 39° 46°, 51°, 53°,			
	55°, 64°, 66°	90	1760	8
	8°, 26° (b) or (c)	80	1760	8 + 6.1

250 000
(cont'd)

Name of substance (a)	Class and item number (b)	Hazard Identification No. (upper part) (c)	Substance Identification No. (lower part) (d)	Label (e)
Corrosive or slightly corrosive solids, combustible	8, letters (b) and (c) of items 27°, 31°, 33° 35°, 38°, 39° 46°, 51°, 52° 54, 55°, 64°, 65°	80	2921	8
Corrosive or slightly corrosive solids, not combustible	8, letters (b) and (c) of items 11°, 22°, 27° 31°, 33°, 35° 38°, 39°, 41° 45, 46°, 55°, 65°	80	1759	8
	8, 26°(b) or (c)	80	1759	8 + 6.1

Authentic texts of the amendments: English and French.

Registered ex officio *on 1 January 1993.*