Chapter 4.1

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

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

NOTE: For the packing of goods of Classes 2, 6.2 and 7, the general provisions of this section only apply as indicated in 4.1.8.2 (Class 6.2), 4.1.9.1.5 (Class 7) and in the applicable packing instructions of 4.1.4 (P201 and LP02 for Class 2 and P620, P621, IBC620 and LP621 for Class 6.2).

4.1.1.1 Dangerous goods shall be packed in good quality packagings, including IBCs and large packagings, which shall be strong enough to withstand the shocks and loadings normally encountered during carriage, including trans-shipment between transport units and between transport units and warehouses as well as any removal from a pallet or overpack for subsequent manual or mechanical handling. Packagings, including IBCs and large packagings, shall be constructed and closed so as to prevent any loss of contents when prepared for transport which might be caused under normal conditions of transport, by vibration, or by changes in temperature, humidity or pressure (resulting from altitude, for example). Packagings, including IBCs and large packagings, shall be closed in accordance with the information provided by the manufacturer. No dangerous residue shall adhere to the outside of packagings, IBCs and large packagings during carriage. These provisions apply, as appropriate, to new, reused, reconditioned or remanufactured packagings and to new, reused, repaired or remanufactured IBCs, and to new or reused large packagings.

4.1.1.2 Parts of packagings, including IBCs and large packagings, which are in direct contact with dangerous goods:

(a) shall not be affected or significantly weakened by those dangerous goods; and

(b) shall not cause a dangerous effect e.g. catalysing a reaction or reacting with the dangerous goods.

Where necessary, they shall be provided with a suitable inner coating or treatment.

NOTE: For chemical compatibility of plastics packagings, including IBCs, made from polyethylene, see 4.1.1.19.

4.1.1.3 Unless otherwise provided elsewhere in RID, each packaging, including IBCs and large packagings, except inner packagings, shall conform to a design type successfully tested in accordance with the requirements of 6.1.5, 6.3.2, 6.5.6 or 6.6.5, as applicable. The packagings for which the test is not required are mentioned under 6.1.1.3.

4.1.1.4 When filling packagings, including IBCs and large packagings, with liquids, sufficient ullage (outage) shall be left to ensure that neither leakage nor permanent distortion of the packaging occurs as a result of an expansion of the liquid caused by temperatures likely to occur during transport. Unless specific requirements are prescribed, liquids shall not completely fill a packaging at a temperature of 55 °C. However, sufficient ullage shall be left in an IBC to ensure that at the mean bulk temperature of 50 °C it is not filled to more than 98% of its water capacity. For a filling temperature of 15 °C, the maximum degree of filling shall be determined as follows, unless otherwise provided, either:

(a)

Boiling point (initial boiling point) of the substance in °C	< 60	≥ 60 < 100	≥ 100 < 200	≥ 200 < 300	≥ 300
Degree of filling as a percentage of the capacity of the packaging	90	92	94	96	98

or

(b) degree of filling $= \dfrac{98}{1+\alpha(50-t_F)}$ % of the capacity of the packaging

In this formula α represents the mean coefficient of cubic expansion of the liquid substance between 15 °C and 50 °C; that is to say, for a maximum rise in temperature of 35 °C,

α is calculated according to the formula: $\alpha = \dfrac{d_{15} - d_{50}}{35 \times d_{50}}$

d_{15} and d_{50} being the relative densities[1] of the liquid at 15 °C and 50 °C and t_F the mean temperature of the liquid at the time of filling.

[1] Relative density (d) is considered to be synonymous with specific gravity (SG) and will be used throughout this Chapter.

4.1.1.4.1 For air transport, packagings intended to contain liquids shall also be capable of withstanding a pressure differential without leakage as specified in the international regulations for air transport.

4.1.1.5 Inner packagings shall be packed in an outer packaging in such a way that, under normal conditions of carriage, they cannot break, be punctured or leak their contents into the outer packaging. Inner packagings containing liquids shall be packed with their closures upward and placed within outer packagings consistent with the orientation markings prescribed in 5.2.1.9. Inner packagings that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials, etc., shall be secured in outer packagings with suitable cushioning material. Any leakage of the contents shall not substantially impair the protective properties of the cushioning material or of the outer packaging.

4.1.1.5.1 Where an outer packaging of a combination packaging or a large packaging has been successfully tested with different types of inner packagings, a variety of such different inner packagings may also be assembled in this outer packaging or large packaging. In addition, provided an equivalent level of performance is maintained, the following variations in inner packagings are allowed without further testing of the package:

(a) Inner packagings of equivalent or smaller size may be used provided:

(i) the inner packagings are of similar design to the tested inner packagings (e.g. shape - round, rectangular, etc.);

(ii) the material of construction of the inner packagings (glass, plastics, metal, etc.) offers resistance to impact and stacking forces equal to or greater than that of the originally tested inner packaging;

(iii) the inner packagings have the same or smaller openings and the closure is of similar design (e.g. screw cap, friction lid, etc.);

(iv) sufficient additional cushioning material is used to take up void spaces and to prevent significant movement of the inner packagings; and

(v) inner packagings are oriented within the outer packaging in the same manner as in the tested package.

(b) A lesser number of the tested inner packagings, or of the alternative types of inner packagings identified in (a) above, may be used provided sufficient cushioning is added to fill the void space(s) and to prevent significant movement of the inner packagings.

4.1.1.6 Dangerous goods shall not be packed together in the same outer packaging or in large packagings, with dangerous or other goods if they react dangerously with each other (see definition of “dangerous reaction” in 1.2.1).

NOTE: For mixed packing special provisions, see 4.1.10.

4.1.1.7 The closures of packagings containing wetted or diluted substances shall be such that the percentage of liquid (water, solvent or phlegmatizer) does not fall below the prescribed limits during transport.

4.1.1.7.1 Where two or more closure systems are fitted in series on an IBC, that nearest to the substance being carried shall be closed first.

4.1.1.8 Where pressure may develop in a package by the emission of gas from the contents (as a result of temperature increase or other causes), the packaging or IBC may be fitted with a vent provided that the gas emitted will not cause danger on account of its toxicity, its flammability or the quantity released, for example.

A venting device shall be fitted if dangerous overpressure may develop due to normal decomposition of substances. The vent shall be so designed that, when the packaging or IBC is in the attitude in which it is intended to be carried, leakages of liquid and the penetration of foreign substances are prevented under normal conditions of carriage.

NOTE: Venting of the package is not permitted for air carriage.

4.1.1.8.1 Liquids may only be filled into inner packagings which have an appropriate resistance to internal pressure that may be developed under normal conditions of carriage.

4.1.1.9 New, remanufactured or reused packagings, including IBCs and large packagings, or reconditioned packagings and repaired or routinely maintained IBCs shall be capable of passing the tests prescribed in 6.1.5, 6.3.2, 6.5.6 or 6.6.5, as applicable. Before being filled and handed over for carriage, every packaging, including IBCs and large packagings, shall be inspected to ensure that it is free from corrosion, contamination or other damage and every IBC shall be inspected with regard to the proper functioning of any service equipment. Any packaging which shows signs of reduced strength as compared with the approved design type shall no longer be used or shall be so reconditioned, that it is able to withstand the design type tests. Any IBC which shows signs of reduced strength as compared with the tested design type shall no longer be used or shall be so repaired or routinely maintained that it is able to withstand the design type tests.

4.1.1.10 Liquids shall be filled only into packagings, including IBCs, which have an appropriate resistance to the internal pressure that may develop under normal conditions of carriage. Packagings and IBCs marked with the hydraulic test pressure prescribed in 6.1.3.1 (d) and 6.5.2.2.1, respectively shall be filled only with a liquid having a vapour pressure:

(a) such that the total gauge pressure in the packaging or IBC (i.e. the vapour pressure of the filling substance plus the partial pressure of air or other inert gases, less 100 kPa) at 55 °C, determined on the basis of a maximum degree of filling in accordance with 4.1.1.4 and a filling temperature of 15 °C, will not exceed two-thirds of the marked test pressure; or

(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.

IBCs intended for the carriage of liquids shall not be used to carry liquids having a vapour pressure of more than 110 kPa (1.1 bar) at 50 °C or 130 kPa (1.3 bar) at 55 °C.

Examples of required marked test pressures for packagings, including IBCs, calculated as in 4.1.1.10 (c)

UN No	Name	Class	Packing group	Vp_{55} (kPa)	(Vp_{55}× 1,5) (kPa)	(Vp_{55}× 1,5) minus 100 (kPa)	Required minimum test pressure gauge under 6.1.5.5.4 (c) (kPa)	Minimum test pressure (gauge) to be marked on the packaging (kPa)
2056	Tetrahydrofuran	3	II	70	105	5	100	100
2247	n-Decane	3	III	1,4	2,1	– 97,9	100	100
1593	Dichloromethane	6.1	III	164	246	146	146	150
1155	Diethyl ether	3	I	199	299	199	199	250

NOTE 1: For pure liquids the vapour pressure at 55 °C (V_{p55}) can often be obtained from scientific tables.

2: The table refers to the use of 4.1.1.10 (c) only, which means that the marked test pressure shall exceed 1.5 times the vapour pressure at 55 °C less 100 kPa. When, for example, the test pressure for n-decane is determined according to 6.1.5.5.4 (a), the minimum marked test pressure may be lower.

3: For diethyl ether the required minimum test pressure under 6.1.5.5.5 is 250 kPa.

4.1.1.11 Empty packagings, including IBCs and large packagings, that have contained a dangerous substance are subject to the same requirements as those for a filled packaging, unless adequate measures have been taken to nullify any hazard.

4.1.1.12 Every packagings as specified in Chapter 6.1 intended to contain liquids shall successfully undergo a suitable leakproofness test, and be capable of meeting the appropriate test level indicated in 6.1.5.4.3:

(a) before it is first used for carriage;

(b) after remanufacturing or reconditioning of any packaging, before it is re-used for carriage.

For this test the packaging need not have its closures fitted. The inner receptacle of a composite packaging may be tested without the outer packaging, provided the test results are not affected.

This test is not required for:

– inner packagings of combination packagings or large packagings;

– inner receptacles of composite packagings (glass, porcelain or stoneware) marked with the symbol "RID/ADR" in accordance with 6.1.3.1 (a) (ii);

– light gauge metal packagings marked with the symbol "RID/ADR" in accordance with 6.1.3.1 (a) (ii).

4.1.1.13 Packagings, including IBCs, used for solids which may become liquid at temperatures likely to be encountered during carriage shall also be capable of containing the substance in the liquid state.

4.1.1.14 Packagings, including IBCs, used for powdery or granular substances shall be sift-proof or shall be provided with a liner.

4.1.1.15 For plastics drums and jerricans, rigid plastics IBCs and composite IBCs with plastics inner receptacles, unless otherwise approved by the competent authority, the period of use permitted for the carriage of dangerous substances shall be five years from the date of manufacture of the receptacles, except where a shorter period of use is prescribed because of the nature of the substance to be carried.

4.1.1.16 Packagings, including IBCs and large packagings, marked in accordance with 6.1.3, 6.2.2.7, 6.2.2.8, 6.3.1, 6.5.2 or 6.6.3, but which are approved in a State which is not a COTIF Member State, may nevertheless be used for carriage under RID.

4.1.1.17 Explosives, self-reactive substances and organic peroxides

Unless specific provision to the contrary is made in RID, the packagings, including IBCs and large packagings, used for goods of Class 1, self-reactive substances of Class 4.1 and organic peroxides of Class 5.2 shall comply with the provisions for the medium danger group (packing group II).

4.1.1.18 Use of salvage packagings

4.1.1.18.1 Damaged, defective, leaking or non-conforming packages, or dangerous goods that have spilled or leaked may be carried in salvage packagings mentioned in 6.1.5.1.11. This does not prevent the use of a bigger size packaging of appropriate type and performance level under the conditions of 4.1.1.18.2 and 4.1.1.18.3.

4.1.1.18.2 Appropriate measures shall be taken to prevent excessive movement of the damaged or leaking packages within a salvage packaging. When the salvage packaging contains liquids, sufficient inert absorbent material shall be added to eliminate the presence of free liquid.

4.1.1.18.3 Appropriate measures shall be taken to ensure that there is no dangerous build up of pressure.

4.1.1.19 Verification of the chemical compatibility of plastics packagings, including IBCs, by assimilation of filling substances to standard liquids

4.1.1.19.1 Scope

For polyethylene packagings as specified in 6.1.5.2.6 and for polyethylene IBCs as specified in 6.5.6.3.5, the chemical compatibility with filling substances may be verified by assimilation to standard liquids following the procedures as set out in 4.1.1.19.3 to 4.1.1.19.5 and using the list in table 4.1.1.19.6, provided that the particular design types have been tested with these standard liquids in accordance with 6.1.5 or 6.5.6, taking into account 6.1.6 and that the conditions in 4.1.1.19.2 are met. When assimilation in accordance with this sub-section is not possible, the chemical compatibility needs to be verified by design type testing in accordance with 6.1.5.2.5 or by laboratory tests in accordance with 6.1.5.2.7 for packagings, and in accordance with 6.5.6.3.3 or 6.5.6.3.6 for IBCs, respectively.

NOTE: Irrespective of the provisions of this sub-section, the use of packagings, including IBCs, for a specific filling substance is subject to the limitations of Table A of Chapter 3.2, and the packing instructions in Chapter 4.1.

4.1.1.19.2 Conditions

The relative densities of the filling substances shall not exceed that used to determine the height for the drop test performed successfully according to 6.1.5.3.5 or 6.5.6.9.4 and the mass for the stacking test performed successfully according to 6.1.5.6 or where necessary according to 6.5.6.6 with the assimilated standard liquid(s). The vapour pressures of the filling substances at 50 °C or 55 °C shall not exceed that used to determine the pressure for the internal pressure (hydraulic) test performed successfully according to 6.1.5.5.4 or 6.5.6.8.4.2 with the assimilated standard liquid(s). In case that filling substances are assimilated to a combination of standard liquids, the corresponding values of the filling substances shall not exceed the minimum values derived from the applied drop heights, stacking masses and internal test pressures.

Example: UN 1736 Benzoyl chloride is assimilated to the combination of standard liquids "Mixture of hydrocarbons and wetting solution". It has a vapour pressure of 0.34 kPa at 50 °C and a relative density of approximately 1.2. Design type tests for plastics drums and jerricans were frequently performed at minimum required test levels. In practice this means that the stacking test is commonly performed with stacking loads considering only a relative density of 1.0 for the "Mixture of hydrocarbons" and a relative density of 1.2 for the "Wetting solution" (see definition of standard liquids in 6.1.6). As a consequence chemical compatibility of such tested design types would not be verified for benzoyl chloride by reason of the inadequate test level of the design type with the standard liquid "mixture of hydrocarbons". (Due to the fact that in the majority of cases the applied internal hydraulic test pressure is not less than 100 kPa, the vapour pressure of benzoyl chloride would be covered by such test level according to 4.1.1.10).

All components of a filling substance, which may be a solution, mixture or preparation, such as wetting agents in detergents and disinfectants, irrespective of whether dangerous or non-dangerous, shall be included in the assimilation procedure.

4.1.1.19.3 Assimilation procedure

The following steps shall be taken to assign filling substances to listed substances or groups of substances in table 4.1.1.19.6 (see also scheme in Figure 4.1.1.19.1):

(a) Classify the filling substance in accordance with the procedures and criteria of Part 2 (determination of the UN number and packing group);

(b) If it is included there, go to the UN number in column (1) of table 4.1.1.19.6;

(c) Select the line that corresponds in terms of packing group, concentration, flashpoint, the presence of non-dangerous components etc. by means of the information given in columns (2a), (2b) and (4), if there is more than one entry for this UN number.

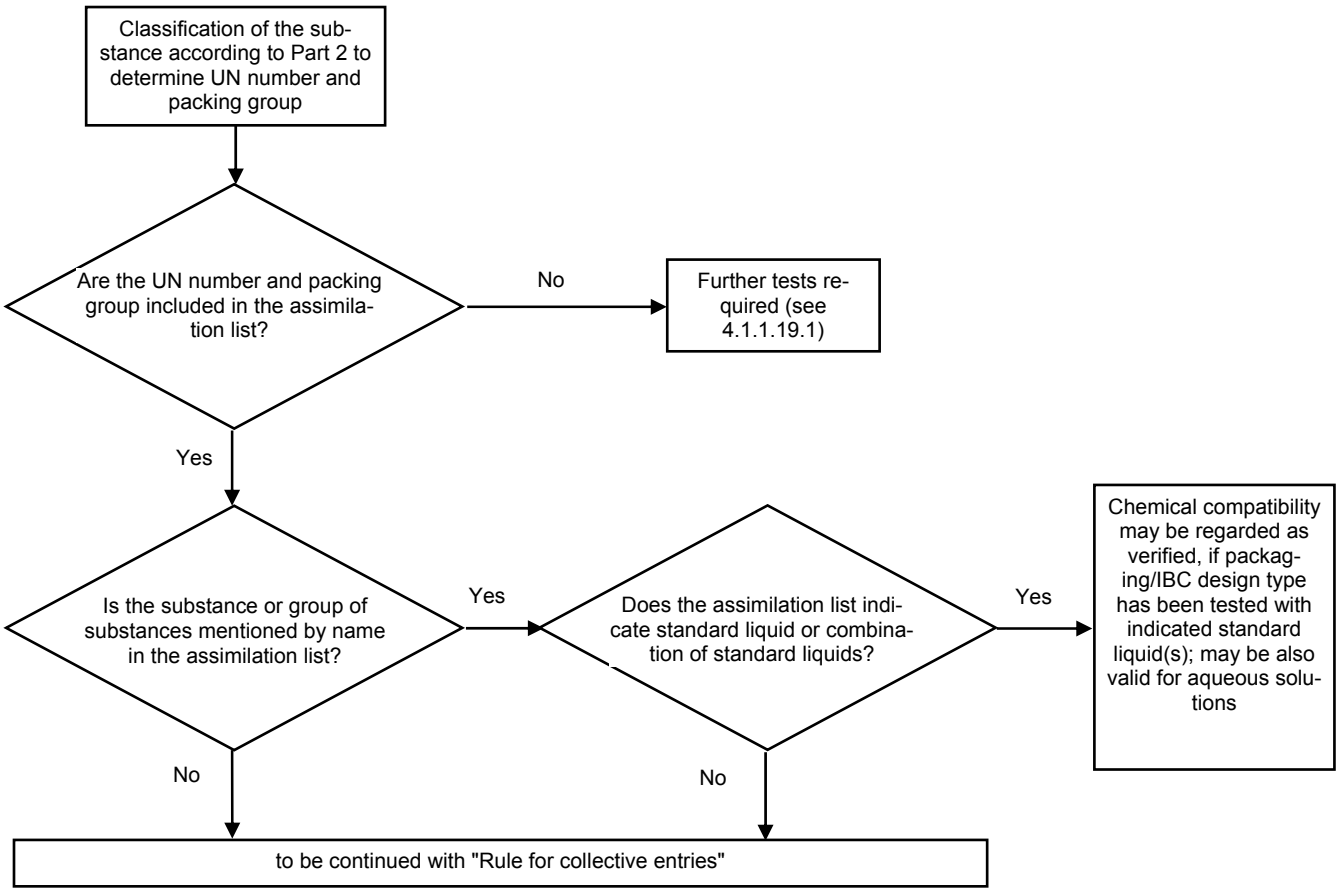
If this is not possible, the chemical compatibility shall be verified in accordance with 6.1.5.2.5 or 6.1.5.2.7 for packagings, and in accordance with 6.5.6.3.3 or 6.5.6.3.6 for IBCs (however, in the case of aqueous solutions, see 4.1.1.19.4);

(d) If the UN number and packing group of the filling substance determined in accordance with (a) is not included in the assimilation list, the chemical compatibility shall be proved in accordance with 6.1.5.2.5 or 6.1.5.2.7 for packagings, and in accordance with 6.5.6.3.3 or 6.5.6.3.6 for IBCs;

(e) Apply the "Rule for collective entries", as described in 4.1.1.19.5, if this is indicated in column (5) of the selected line;

(f) The chemical compatibility of the filling substance may be regarded as verified taking into account 4.1.1.19.1 and 4.1.1.19.2, if a standard liquid or a combination of standard liquids is assimilated in column (5) and the design type is approved for that/those standard liquid(s).

Figure 4.1.1.19.1: Scheme for the assimilation of filling substances to standard liquids



4.1.1.19.4 Aqueous solutions

Aqueous solutions of substances and groups of substances assimilated to specific standard liquid(s) in accordance with 4.1.1.19.3 may also be assimilated to that (those) standard liquid(s) provided the following conditions are met:

(a) the aqueous solution can be assigned to the same UN number as the listed substance in accordance with the criteria of 2.1.3.3, and

(b) the aqueous solution is not specifically mentioned by name otherwise in the assimilation list in 4.1.1.19.6, and

(c) no chemical reaction is taking place between the dangerous substance and the solvent water.

Example: Aqueous solutions of UN 1120 tert-Butanol:

– *Pure tert-Butanol itself is assigned to the standard liquid "acetic acid" in the assimilation list.*

– *Aqueous solutions of tert-Butanol can be classified under the entry UN 1120 BUTANOLS in accordance with 2.1.3.3, because the aqueous solution of tert-Butanol does not differ from the entries of the pure substances relating to the class, the packing group(s) and the physical state. Furthermore, the entry "1120 BUTANOLS" is not explicitly limited to the pure substances, and aqueous solutions of these substances are not specifically mentioned by name otherwise in Table A of Chapter 3.2 as well as in the assimilation list.*

– *UN 1120 BUTANOLS do not react with water under normal conditions of carriage.*

As a consequence, aqueous solutions of UN 1120 tert-Butanol may be assigned to the standard liquid "acetic acid".

4.1.1.19.5 Rule for collective entries

For the assimilation of filling substances for which "Rule for collective entries" is indicated in column (5), the following steps shall be taken and conditions be met (see also scheme in Figure 4.1.1.19.2):

(a) Perform the assimilation procedure for each dangerous component of the solution, mixture or preparation in accordance with 4.1.1.19.3 taking into account the conditions in 4.1.1.19.2. In the case of generic entries, components may be neglected, that are known to have no damaging effect on high density polyethylene (e.g. solid pigments in UN 1263 PAINT or PAINT RELATED MATERIAL);

(b) A solution, mixture or preparation cannot be assimilated to a standard liquid, if:

  (i) the UN number and packing group of one or more of the dangerous components does not appear in the assimilation list; or

  (ii) "Rule for collective entries" is indicated in column (5) of the assimilation list for one or more of the dangerous components; or

  (iii) (with the exception of UN 2059 NITROCELLULOSE SOLUTION, FLAMMABLE) the classification code of one or more of its dangerous components differs from that of the solution, mixture or preparation.

(c) If all dangerous components are listed in the assimilation list, and its classification codes are in accordance with the classification code of the solution, mixture or preparation itself, and all dangerous components are assimilated to the same standard liquid or combination of standard liquids in column (5), the chemical compatibility of the solution, mixture or preparation may be regarded as verified taking into account 4.1.1.19.1 and 4.1.1.19.2;

(d) If all dangerous components are listed in the assimilation list and its classification codes are in accordance with the classification code of the solution, mixture or preparation itself, but different standard liquids are indicated in column (5), the chemical compatibility may only be regarded as verified for the following combinations of standard liquids taking into account 4.1.1.19.1 and 4.1.1.19.2:

  (i) water/nitric acid 55%; with the exception of inorganic acids with classification code C1, which are assigned to standard liquid "water";

  (ii) water/wetting solution;

  (iii) water/acetic acid;

  (iv) water/mixture of hydrocarbons;

  (v) water/n-butyl acetate – n-butyl acetate-saturated wetting solution.

(e) In the context of this rule, chemical compatibility is not regarded as verified for other combinations of standard liquids than those specified in (d) and for all cases specified in (b). In such cases the chemical compatibility shall be verified by other means (see 4.1.1.19.3 (d)).

Example 1: Mixture of UN 1940 THIOGLYCOLIC ACID (50%) and UN 2531 METHACRYLIC ACID, STABILIZED (50%); classification of the mixture: UN 3265 CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S

– *Both the UN numbers of the components and the UN number of the mixture are included in the assimilation list;*

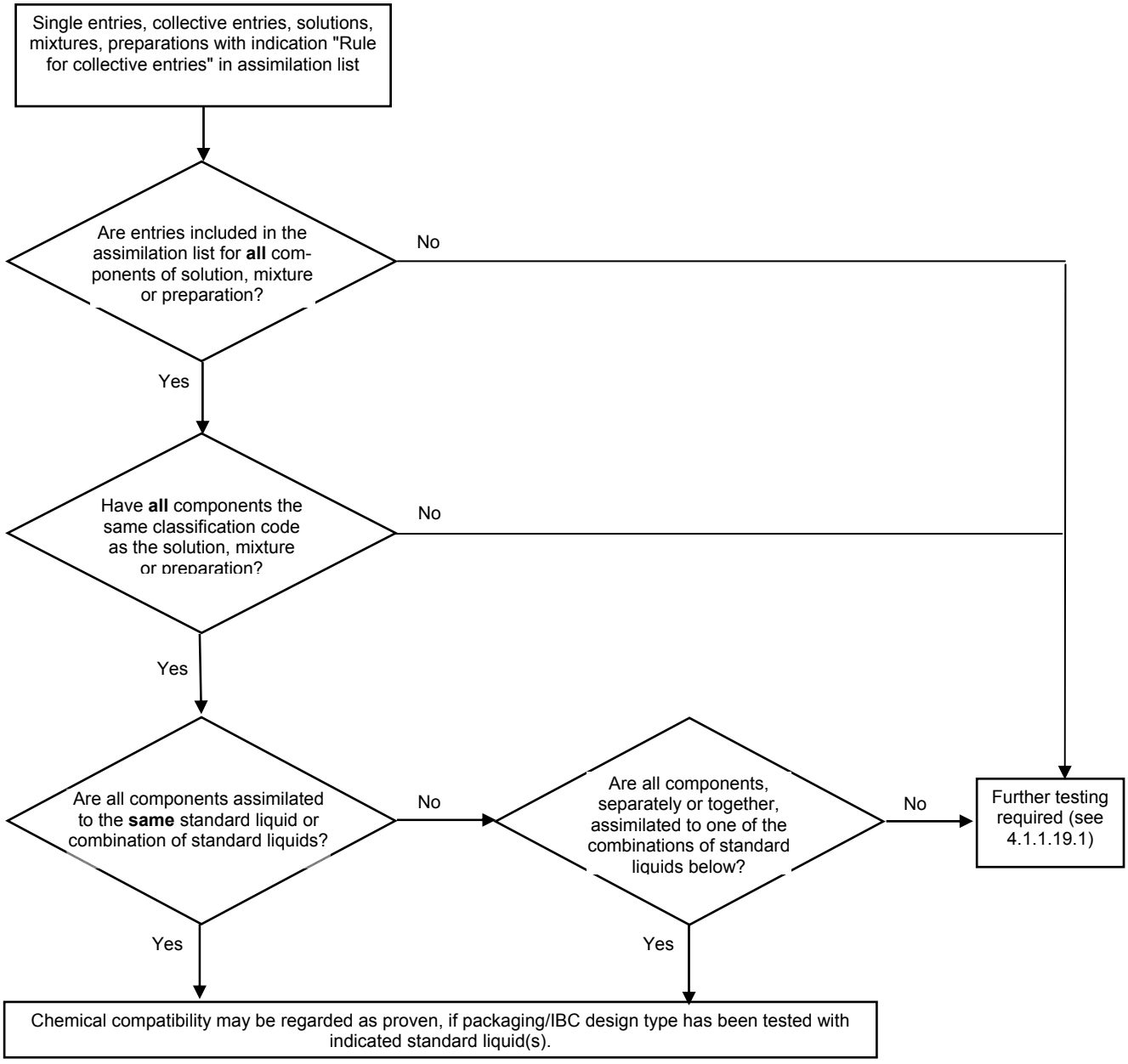
– *Both the components and the mixture have the same classification code: C3;*

– *UN 1940 THIOGLYCOLIC ACID is assimilated to standard liquid "acetic acid", and UN 2531 METHACRYLIC ACID, STABILIZED is assimilated to standard liquid "n-butyl acetate/n-butyl acetate-saturated wetting solution". According to paragraph (d) this is not an acceptable combination of standard liquids. The chemical compatibility of the mixture has to be verified by other means.*

Example 2: Mixture of UN 1793 ISOPROPYL ACID PHOSPHATE (50%) and UN 1803 PHENOLSULPHONIC ACID, LIQUID (50%); classification of the mixture: UN 3265 CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.

– *Both the UN numbers of the components and the UN number of the mixture are included in the assimilation list;*
– *Both the components and the mixture have the same classification code: C3;*
– *UN 1793 ISOPROPYL ACID PHOSPHATE is assimilated to standard liquid "wetting solution", and UN 1803 PHENOLSULPHONIC ACID, LIQUID is assimilated to standard liquid "water". According to paragraph (d) this is one of the acceptable combinations of standard liquids. As a consequence the chemical compatibility may be regarded as verified for this mixture, provided the packaging design type is approved for the standard liquids "wetting solution" and "water".*

Figure 4.1.1.19.2: Scheme "Rules for collective entries"



Acceptable combinations of standard liquids:

- water/nitric acid (55%), with the exception of inorganic acids of classification code C1 which are assigned to standard liquid "water";
- water/wetting solution;
- water/acetic acid;
- water/mixture of hydrocarbons;
- water/n-butyl acetate – n-butyl acetate saturated wetting solution

4.1.1.19.6 Assimilation list

In the following table (assimilation list) dangerous substances are listed in the numerical order of their UN numbers. As a rule, each line deals with a dangerous substance, single entry or collective entry covered by a specific UN number. However, several consecutive lines may be used for the same UN number, if substances belonging to the same UN number have different names (e.g. individual isomers of a group of substances), different chemical properties, different physical properties and/or different transport conditions. In such cases the single entry or collective entry within the particular packing group is the last one of such consecutive lines.

Columns (1) to (4) of table 4.1.1.19.6, following a structure similar to that of Table A of Chapter 3.2, are used to identify the substance for the purpose of this sub-section. The last column indicates the standard liquid(s) to which the substance can be assimilated.

Explanatory notes for each column:

Column (1) UN No.

Contains the UN number

- of the dangerous substance, if the substance has been assigned its own specific UN number, or
- of the collective entry to which dangerous substances not listed by name have been assigned in accordance with the criteria ("decision trees") of Part 2.

Column (2a) Proper shipping name or technical name

Contains the name of the substance, the name of the single entry, which may cover various isomers, or the name of the collective entry itself.

The indicated name can deviate from the applicable proper shipping name.

Column (2b) Description

Contains a descriptive text to clarify the scope of the entry in those cases when the classification, the transport conditions and/or the chemical compatibility of the substance may be variable.

Column (3a) Class

Contains the number of the class, whose heading covers the dangerous substance. This class number is assigned in accordance with the procedures and criteria of Part 2.

Column (3b) Classification code

Contains the classification code of the dangerous substance in accordance with the procedures and criteria of Part 2.

Column (4) Packing group

Contains the packing group number(s) (I, II or III) assigned to the dangerous substance. These packing group numbers are assigned in accordance with the procedures and criteria of Part 2. Certain substances are not assigned to packing groups.

Column (5) Standard liquid

This column indicates, as definite information, either a standard liquid or a combination of standard liquids to which the substance can be assimilated, or a reference to the rule for collective entries in 4.1.1.19.5.

Table 4.1.1.19.6: Assimilation list

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
1090	**Acetone**		3	F1	II	Mixture of hydrocarbons **Remark:** applicable only, if it is proved that the permeability of the substance out of the package intended for carriage has an acceptable level
1093	**Acrylonitrile, stabilized**		3	FT1	I	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1104	**Amyl acetates**	pure isomers and isomeric mixture	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1105	**Pentanols**	pure isomers and isomeric mixture	3	F1	II/III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1106	**Amylamine**s	pure isomers and isomeric mixture	3	FC	II/III	Mixture of hydrocarbons **and** wetting solution
1109	**Amyl formates**	pure isomers and isomeric mixture	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1120	**Butanols**	pure isomers and isomeric mixture	3	F1	II/III	Acetic acid
1123	**Butyl acetates**	pure isomers and isomeric mixture	3	F1	II/III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1125	**n-Butylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1128	**n-Butyl formate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1129	**Butyraldehyde**		3	F1	II	Mixture of hydrocarbons
1133	**Adhesives**	containing flammable liquid	3	F1	I/II/III	Rule for collective entries
1139	**Coating solution**	includes surface treatments or coatings used for industrial or other purposes such as vehicle under coating, drum or barrel lining	3	F1	I/II/III	Rule for collective entries
1145	**Cyclohexane**		3	F1	II	Mixture of hydrocarbons
1146	**Cyclopentane**		3	F1	II	Mixture of hydrocarbons
1153	**Ethylene glycol diethyl ether**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
1154	**Diethylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1158	**Diisopropylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1160	**Dimethylamine aqueous solution**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1165	**Dioxane**		3	F1	II	Mixture of hydrocarbons

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
1169	**Extracts, aromatic, liquid**		3	F1	I/II/III	Rule for collective entries
1170	**Ethanol** or **Ethanol solution**	aqueous solution	3	F1	II/III	Acetic acid
1171	**Ethylene glycol monoethyl ether**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
1172	**Ethylene glycol monoethyl ether acetate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
1173	**Ethyl acetate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1177	**2-Ethylbutyl acetate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1178	**2-Ethylbutyraldehyde**		3	F1	II	Mixture of hydrocarbons
1180	**Ethyl butyrate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1188	**Ethylene glycol monomethyl ether**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
1189	**Ethylene glycol monomethyl ether acetate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
1190	**Ethyl formate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1191	**Octyl aldehydes**	pure isomers and isomeric mixture	3	F1	III	Mixture of hydrocarbons
1192	**Ethyl lactate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1195	**Ethyl propionate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1197	**Extracts, flavouring, liquid**		3	F1	I/II/III	Rule for collective entries
1198	**Formaldehyde solution, flammable**	aqueous solution, flashpoint between 23 °C and 60 °C	3	FC	III	Acetic acid
1202	**Diesel fuel**	complying with EN 590:2004 or with a flashpoint not more than 100 °C	3	F1	III	Mixture of hydrocarbons
1202	**Gas oil**	flashpoint not more than 100 °C	3	F1	III	Mixture of hydrocarbons
1202	**Heating oil, light**	extra light	3	F1	III	Mixture of hydrocarbons
1202	**Heating oil, light**	complying with EN 590:2004 or with a flashpoint not more than 100 °C	3	F1	III	Mixture of hydrocarbons
1203	**Motor spirit** or **gasoline** or **petrol**		3	F1	II	Mixture of hydrocarbons

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
1206	**Heptanes**	pure isomers and isomeric mixture	3	F1	II	Mixture of hydrocarbons
1207	**Hexaldehyde**	n-Hexaldehyde	3	F1	III	Mixture of hydrocarbons
1208	**Hexanes**	pure isomers and isomeric mixture	3	F1	II	Mixture of hydrocarbons
1210	**Printing ink** or **Printing ink related material**	flammable, including printing ink thinning or reducing compound	3	F1	I/II/III	Rule for collective entries
1212	**Isobutanol**		3	F1	III	Acetic acid
1213	**Isobutyl acetate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1214	**Isobutylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1216	**Isooctene**s	pure isomers and isomeric mixture	3	F1	II	Mixture of hydrocarbons
1219	**Isopropanol**		3	F1	II	Acetic acid
1220	**Isopropyl acetate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1221	**Isopropylamine**		3	FC	I	Mixture of hydrocarbons **and** wetting solution
1223	**Kerosene**		3	F1	III	Mixture of hydrocarbons
1224	3,3-Dimethyl-2-butanone		3	F1	II	Mixture of hydrocarbons
1224	**Ketones, liquid, n.o.s.**		3	F1	II/III	Rule for collective entries
1230	**Methanol**		3	FT1	II	Acetic acid
1231	**Methyl acetate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1233	**Methylamyl acetate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1235	**Methylamine, aqueous solution**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1237	**Methyl butyrate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1247	**Methyl methacrylate monomer, stabilized**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1248	**Methyl propionate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1262	**Octanes**	pure isomers and isomeric mixture	3	F1	II	Mixture of hydrocarbons
1263	**Paint** or **Paint related material**	including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base or including paint thinning and reducing compound	3	F1	I/II/III	Rule for collective entries
1265	**Pentanes**	n-Pentane	3	F1	II	Mixture of hydrocarbons
1266	**Perfumery products**	with flammable solvents	3	F1	I/II/III	Rule for collective entries
1268	Coal tar naphtha	vapour pressure at 50 °C not more than 110 kPa	3	F1	II	Mixture of hydrocarbons

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
1268	**Petroleum distillates, n.o.s.** or **Petroleum products, n.o.s.**		3	F1	I/II/III	Rule for collective entries
1274	**n-Propanol**		3	F1	II/III	Acetic acid
1275	**Propionaldehyde**		3	F1	II	Mixture of hydrocarbons
1276	**n-Propyl acetate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1277	**Propylamine**	n-Propylamine	3	FC	II	Mixture of hydrocarbons **and** wetting solution
1281	**Propyl formates**	pure isomers and isomeric mixture	3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1282	**Pyridine**		3	F1	II	Mixture of hydrocarbons
1286	**Rosin oil**		3	F1	I/II/III	Rule for collective entries
1287	**Rubber solution**		3	F1	I/II/III	Rule for collective entries
1296	**Triethylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
1297	**Trimethylamine, aqueous solution**	not more than 50% trimethylamine, by mass	3	FC	I/II/III	Mixture of hydrocarbons **and** wetting solution
1301	**Vinyl acetate, stabilized**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1306	**Wood preservatives, liquid**		3	F1	II/III	Rule for collective entries
1547	**Aniline**		6.1	T1	II	Acetic acid
1590	**Dichloroanilines**, **liquid**	pure isomers and isomeric mixture	6.1	T1	II	Acetic acid
1602	**Dye, liquid, toxic, n.o.s.** or **Dye intermediate, liquid, toxic, n.o.s.**		6.1	T1	I/II/III	Rule for collective entries
1604	**Ethylenediamine**		8	CF1	II	Mixture of hydrocarbons **and** wetting solution
1715	**Acetic anhydride**		8	CF1	II	Acetic acid
1717	**Acetyl chloride**		3	FC	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1718	**Butyl acid phosphate**		8	C3	III	Wetting solution
1719	Hydrogen sulphide	aqueous solution	8	C5	III	Acetic acid
1719	**Caustic alkali liquid, n.o.s.**	inorganic	8	C5	II/III	Rule for collective entries
1730	**Antimony pentachloride, liquid**	pure	8	C1	II	Water
1736	**Benzoyl chloride**		8	C3	II	Mixture of hydrocarbons **and** wetting solution
1750	**Chloroacetic acid solution**	aqueous solution	6.1	TC1	II	Acetic acid
1750	**Chloroacetic acid solution**	mixtures of mono- and dichloroacetic acid	6.1	TC1	II	Acetic acid
1752	**Chloroacetyl chloride**		6.1	TC1	I	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1755	**Chromic acid solution**	aqueous solution with not more than 30% chromic acid	8	C1	II/III	Nitric acid
1760	Cyanamide	aqueous solution with not more than 50% cyanamide	8	C9	II	Water

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
1760	O,O-Diethyl-dithiophosphoric acid		8	C9	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1760	O,O-Diisopropyl-dithiophosphoric acid		8	C9	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1760	O,O-Di-n-propyl-dithiophosphoric acid		8	C9	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1760	**Corrosive liquid, n.o.s.**	flashpoint more than 60 °C	8	C9	I/II/III	Rule for collective entries
1761	**Cupriethylenediamine solution**	aqueous solution	8	CT1	II/III	Mixture of hydrocarbons **and** wetting solution
1764	**Dichloroacetic acid**		8	C3	II	Acetic acid
1775	**Fluoroboric acid**	aqueous solution with not more than 50% fluoroboric acid	8	C1	II	Water
1778	**Fluorosilicic acid**		8	C1	II	Water
1779	**Formic acid**	with more than 85% acid by mass	8	C3	II	Acetic acid
1783	**Hexamethylenediamine solution**	aqueous solution	8	C7	II/III	Mixture of hydrocarbons **and** wetting solution
1787	**Hydriodic acid**	aqueous solution	8	C1	II/III	Water
1788	**Hydrobromic acid**	aqueous solution	8	C1	II/III	Water
1789	**Hydrochloric acid**	not more than 38% aqueous solution	8	C1	II/III	Water
1790	**Hydrofluoric acid**	with not more than 60% hydrofluoric acid	8	CT1	II	Water the permissible period of use: not more than 2 years
1791	**Hypochlorite solution**	aqueous solution, containing wetting agents as customary in trade	8	C9	II/III	Nitric acid **and** wetting solution(*)
1791	**Hypochlorite solution**	aqueous solution	8	C9	II/III	Nitric acid (*)
(*) For UN 1791: Test to be carried out only with vent. If the test is carried out with nitric acid as the standard liquid, an acid-resistant vent and gasket shall be used. If the test is carried out with hypochlorite solutions themselves, vents and gaskets of the same design type, resistant to hypochlorite (e.g. of silicone rubber) but not resistant to nitric acid, are also permitted.						
1793	**Isopropyl acid phosphate**		8	C3	III	Wetting solution
1802	**Perchloric acid**	aqueous solution with not more than 50% acid, by mass	8	CO1	II	Water
1803	**Phenolsulphonic acid, liquid**	isomeric mixture	8	C3	II	Water
1805	**Phosphoric acid, solution**		8	C1	III	Water
1814	**Potassium hydroxide solution**	aqueous solution	8	C5	II/III	Water
1824	**Sodium hydroxide solution**	aqueous solution	8	C5	II/III	Water
1830	**Sulphuric acid**	with more than 51% pure acid	8	C1	II	Water
1832	**Sulphuric acid, spent**	chemical stable	8	C1	II	Water
1833	**Sulphurous acid**		8	C1	II	Water
1835	**Tetramethylammonium hydroxide, solution**	aqueous solution, flashpoint more than 60 °C	8	C7	II	Water
1840	**Zinc chloride solution**	aqueous solution	8	C1	III	Water
1848	**Propionic acid**	with not less than 10% and less than 90% acid by mass	8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
1862	**Ethyl crotonate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1863	**Fuel, aviation, turbine engine**		3	F1	I/II/III	Mixture of hydrocarbons
1866	**Resin solution**	flammable	3	F1	I/II/III	Rule for collective entries
1902	**Diisooctyl acid phosphate**		8	C3	III	Wetting solution
1906	**Sludge acid**		8	C1	II	Nitric acid
1908	**Chlorite solution**	aqueous solution	8	C9	II/III	Acetic acid
1914	**Butyl propionates**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1915	**Cyclohexanone**		3	F1	III	Mixture of hydrocarbons
1917	**Ethyl acrylate, stabilized**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1919	**Methyl acrylate, stabilized**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1920	**Nonanes**	pure isomers and isomeric mixture, flashpoint between 23 °C and 60 °C	3	F1	III	Mixture of hydrocarbons
1935	**Cyanide solution, n.o.s.**	inorganic	6.1	T4	I/II/III	Water
1940	**Thioglycolic acid**		8	C3	II	Acetic acid
1986	**Alcohols, flammable, toxic, n.o.s.**		3	FT1	I/II/III	Rule for collective entries
1987	Cyclohexanol	technical pure	3	F1	III	Acetic acid
1987	**Alcohols, n.o.s.**		3	F1	II/III	Rule for collective entries
1988	**Aldehydes, flammable, toxic, n.o.s.**		3	FT1	I/II/III	Rule for collective entries
1989	**Aldehydes, n.o.s.**		3	F1	I/II/III	Rule for collective entries
1992	2,6-cis-Dimethyl-morpholine		3	FT1	III	Mixture of hydrocarbons
1992	**Flammable liquid, toxic, n.o.s.**		3	FT1	I/II/III	Rule for collective entries
1993	Propionic acid vinyl ester		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1993	(1-Methoxy-2-propyl) acetate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
1993	**Flammable liquid, n.o.s.**		3	F1	I/II/III	Rule for collective entries
2014	**Hydrogen peroxide, aqueous solution**	with not less than 20% but not more than 60% hydrogen peroxide, stabilized as necessary	5.1	OC1	II	Nitric acid
2022	**Cresylic acid**	liquid mixture containing cresols, xylenols and methyl phenols	6.1	TC1	II	Acetic acid
2030	**Hydrazine aqueous solution**	with not less than 37% but not more than 64% hydrazine, by mass	8	CT1	II	Water
2030	Hydrazine hydrate	aqueous solution with 64% hydrazine	8	CT1	II	Water
2031	**Nitric acid**	other than red fuming, with not more than 55% pure acid	8	CO1	II	Nitric acid
2045	**Isobutyraldehyde**		3	F1	II	Mixture of hydrocarbons
2050	**Diisobutylene isomeric compounds**		3	F1	II	Mixture of hydrocarbons

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
2053	**Methyl isobutyl carbinol**		3	F1	III	Acetic acid
2054	**Morpholine**		8	CF1	I	Mixture of hydrocarbons
2057	**Tripropylene**		3	F1	II/III	Mixture of hydrocarbons
2058	**Valeraldehyde**	pure isomers and isomeric mixture	3	F1	II	Mixture of hydrocarbons
2059	**Nitrocellulose solution, flammable**		3	D	I/II/III	Rule for collective entries: Deviating from the general procedure this rule may be applied to solvents of classification code F1
2075	**Chloral, anhydrous, stabilized**		6.1	T1	II	Wetting solution
2076	**Cresols, liquid**	pure isomers and isomeric mixture	6.1	TC1	II	Acetic acid
2078	**Toluene diisocyanate**	liquid	6.1	T1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2079	**Diethylenetriamine**		8	C7	II	Mixture of hydrocarbons
2209	**Formaldehyde solution**	aqueous solution with 37% Form-aldehyde, methanol content: 8-10%	8	C9	III	Acetic acid
2209	**Formaldehyde solution**	aqueous solution, with not less than 25% formaldehyde	8	C9	III	Water
2218	**Acrylic acid, stabilized**		8	CF1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2227	**n-Butyl methacrylate, stabilized**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2235	**Chlorobenzyl chlorides, liquid**	para-Chlorobenzyl chloride	6.1	T2	III	Mixture of hydrocarbons
2241	**Cycloheptane**		3	F1	II	Mixture of hydrocarbons
2242	**Cycloheptene**		3	F1	II	Mixture of hydrocarbons
2243	**Cyclohexyl acetate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2244	**Cyclopentanol**		3	F1	III	Acetic acid
2245	**Cyclopentanone**		3	F1	III	Mixture of hydrocarbons
2247	**n-Decane**		3	F1	III	Mixture of hydrocarbons
2248	**Di-n-butylamine**		8	CF1	II	Mixture of hydrocarbons
2258	**1,2-Propylenediamine**		8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2259	**Triethylenetetramine**		8	C7	II	Water
2260	**Tripropylamine**		3	FC	III	Mixture of hydrocarbons **and** wetting solution
2263	**Dimethylcyclohexanes**	pure isomers and isomeric mixture	3	F1	II	Mixture of hydrocarbons
2264	**N,N-Dimethyl-cyclohexylamine**		8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2265	**N,N-Dimethyl-formamide**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2266	**Dimethyl-N-propylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
2269	**3,3'-Imino-dipropylamine**		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2270	**Ethylamine, aqueous solution**	with not less than 50% but not more than 70% ethylamine, flashpoint below 23 °C, corrosive or slightly corrosive	3	FC	II	Mixture of hydrocarbons **and** wetting solution
2275	**2-Ethylbutanol**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2276	**2-Ethylhexylamine**		3	FC	III	Mixture of hydrocarbons **and** wetting solution
2277	**Ethyl methacrylate, stabilized**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2278	**n-Heptene**		3	F1	II	Mixture of hydrocarbons
2282	**Hexanols**	pure isomers and isomeric mixture	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2283	**Isobutyl methacrylate, stabilized**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2286	**Pentamethylheptane**		3	F1	III	Mixture of hydrocarbons
2287	**Isoheptenes**		3	F1	II	Mixture of hydrocarbons
2288	**Isohexenes**		3	F1	II	Mixture of hydrocarbons
2289	**Isophoronediamine**		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2293	**4-Methoxy-4-methyl-pentan-2-one**		3	F1	III	Mixture of hydrocarbons
2296	**Methylcyclohexane**		3	F1	II	Mixture of hydrocarbons
2297	**Methylcyclohexanone**	pure isomers and isomeric mixture	3	F1	III	Mixture of hydrocarbons
2298	**Methylcyclopentane**		3	F1	II	Mixture of hydrocarbons
2302	**5-Methylhexan-2-one**		3	F1	III	Mixture of hydrocarbons
2308	**Nitrosylsulphuric acid, liquid**		8	C1	II	Water
2309	**Octadienes**		3	F1	II	Mixture of hydrocarbons
2313	**Picolines**	pure isomers and isomeric mixture	3	F1	III	Mixture of hydrocarbons
2317	**Sodium cuprocyanide solution**	aqueous solution	6.1	T4	I	Water
2320	**Tetraethylenepentamine**		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2324	**Triisobutylene**	mixture of C12-monoolefines, flashpoint between 23 °C and 60 °C	3	F1	III	Mixture of hydrocarbons
2326	**Trimethylcyclohexylamine**		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2327	**Trimethylhexamethylenediamines**	pure isomers and isomeric mixture	8	C7	III	Mixture of hydrocarbons **and** wetting solution
2330	**Undecane**		3	F1	III	Mixture of hydrocarbons

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
2336	**Allyl formate**		3	FT1	I	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2348	**Butyl acrylates, stabilized**	pure isomers and isomeric mixture	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2357	**Cyclohexylamine**	flashpoint between 23 °C and 60 °C	8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2361	**Diisobutylamine**		3	FC	III	Mixture of hydrocarbons **and** wetting solution
2366	**Diethyl carbonate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2367	**alpha-Methylvaleraldehyde**		3	F1	II	Mixture of hydrocarbons
2370	**1-Hexene**		3	F1	II	Mixture of hydrocarbons
2372	**1,2-Di-(dimethylamino)-ethane**		3	F1	II	Mixture of hydrocarbons **and** wetting solution
2379	**1,3-Dimethylbutylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
2383	**Dipropylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
2385	**Ethyl isobutyrate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2393	**Isobutyl formate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2394	**Isobutyl propionate**	flashpoint between 23 °C and 60 °C	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2396	**Methacrylaldehyde, stabilized**		3	FT1	II	Mixture of hydrocarbons
2400	**Methyl isovalerate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2401	**Piperidine**		8	CF1	I	Mixture of hydrocarbons **and** wetting solution
2403	**Isopropenyl acetate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2405	**Isopropyl butyrate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2406	**Isopropyl isobutyrate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2409	**Isopropyl propionate**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2410	**1,2,3,6-Tetrahydropyridine**		3	F1	II	Mixture of hydrocarbons
2427	**Potassium chlorate, aqueous solution**		5.1	O1	II/III	Water
2428	**Sodium chlorate, aqueous solution**		5.1	O1	II/III	Water

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
2429	**Calcium chlorate, aqueous solution**		5.1	O1	II/III	Water
2436	**Thioacetic acid**		3	F1	II	Acetic acid
2457	**2,3-Dimethylbutane**		3	F1	II	Mixture of hydrocarbons
2491	**Ethanolamine**		8	C7	III	Wetting solution
2491	**Ethanolamine solution**	aqueous solution	8	C7	III	Wetting solution
2496	**Propionic anhydride**		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2524	**Ethyl orthoformate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2526	**Furfurylamine**		3	FC	III	Mixture of hydrocarbons **and** wetting solution
2527	**Isobutyl acrylate, stabilized**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2528	**Isobutyl isobutyrate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2529	**Isobutyric acid**		3	FC	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2531	**Methacrylic acid, stabilized**		8	C3	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2542	**Tributylamine**		6.1	T1	II	Mixture of hydrocarbons
2560	**2-Methylpentan-2-ol**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2564	**Trichloroacetic acid solution**	aqueous solution	8	C3	II/III	Acetic acid
2565	**Dicyclohexylamine**		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2571	Ethylsulphuric acid		8	C3	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2571	**Alkylsulphuric acids**		8	C3	II	Rule for collective entries
2580	**Aluminium bromide solution**	aqueous solution	8	C1	III	Water
2581	**Aluminium chloride solution**	aqueous solution	8	C1	III	Water
2582	**Ferric chloride solution**	aqueous solution	8	C1	III	Water
2584	Methane sulphonic acid	with more than 5% free sulphuric acid	8	C1	II	Water
2584	**Alkylsulphonic acids, liquid**	with more than 5% free sulphuric acid	8	C1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2584	Benzene sulphonic acid	with more than 5% free sulphuric acid	8	C1	II	Water
2584	Toluene sulphonic acids	with more than 5% free sulphuric acid	8	C1	II	Water
2584	**Arylsulphonic acids, liquid**	with more than 5% free sulphuric acid	8	C1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2586	Methane sulphonic acid	with not more than 5% free sulphuric acid	8	C3	III	Water

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
2586	**Alkylsulphonic acids, liquid**	with not more than 5% free sulphuric acid	8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2586	Benzene sulphonic acid	with not more than 5% free sulphuric acid	8	C3	III	Water
2586	Toluene sulphonic acids	liquid, with not more than 5% free sulphuric acid	8	C3	III	Water
2586	**Arylsulphonic acids, liquid**	with not more than 5% free sulphuric acid	8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2610	**Triallylamine**		3	FC	III	Mixture of hydrocarbons **and** wetting solution
2614	**Methallyl alcohol**		3	F1	III	Acetic acid
2617	**Methylcyclohexanols**	pure isomers and isomeric mixture, flashpoint between 23 °C and 60 °C	3	F1	III	Acetic acid
2619	**Benzyldimethylamine**		8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2620	**Amyl butyrates**	pure isomers and isomeric mixture, flashpoint between 23 °C and 60 °C	3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2622	**Glycidaldehyde**	flashpoint below 23 °C	3	FT1	II	Mixture of hydrocarbons
2626	**Chloric acid, aqueous solution**	with not more than 10% chloric acid	5.1	O1	II	Nitric acid
2656	**Quinoline**	flashpoint more than 60 °C	6.1	T1	III	Water
2672	**Ammonia solution**	relative density between 0.880 and 0.957 at 15 °C in water, with more than 10% but not more than 35% ammonia	8	C5	III	Water
2683	**Ammonium sulphide solution**	aqueous solution, flashpoint between 23 °C and 60 °C	8	CFT	II	Acetic acid
2684	**3-Diethylaminopropylamine**		3	FC	III	Mixture of hydrocarbons **and** wetting solution
2685	**N,N-Diethylethylenediamine**		8	CF1	II	Mixture of hydrocarbons **and** wetting solution
2693	**Bisulphites, aqueous solution, n.o.s.**	inorganic	8	C1	III	Water
2707	**Dimethyldioxanes**	pure isomers and isomeric mixture	3	F1	II/III	Mixture of hydrocarbons
2733	**Amines, flammable, corrosive , n.o.s.** or **Polyamines, flammable, corrosive, n.o.s.**		3	FC	I/II/III	Mixture of hydrocarbons **and** wetting solution
2734	Di-sec-butylamine		8	CF1	II	Mixture of hydrocarbons
2734	**Amines, liquid, corrosive, flammable, n.o.s.** or **Polyamines, liquid, corrosive, flammable, n.o.s.**		8	CF1	I/II	Mixture of hydrocarbons **and** wetting solution

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
2735	**Amines, liquid, corrosive, n.o.s.** or **Polyamines, liquid, corrosive, n.o.s.**		8	C7	I/II/III	Mixture of hydrocarbons **and** wetting solution
2739	**Butyric anhydride**		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2789	**Acetic acid, glacial** or **Acetic acid solution**	aqueous solution, more than 80% acid, by mass	8	CF1	II	Acetic acid
2790	**Acetic acid solution**	aqueous solution, more than 10% but not more than 80% acid, by mass	8	C3	II/III	Acetic acid
2796	**Sulphuric acid**	with not more than 51% pure acid	8	C1	II	Water
2797	**Battery fluid, alkali**	Potassium/Sodium hydroxide, aqueous solution	8	C5	II	Water
2810	2-Chloro-6-fluorobenzyl chloride	stabilized	6.1	T1	III	Mixture of hydrocarbons
2810	2-Phenylethanol		6.1	T1	III	Acetic acid
2810	Ethylene glycol monohexyl ether		6.1	T1	III	Acetic acid
2810	**Toxic liquid, organic, n.o.s.**		6.1	T1	I/II/III	Rule for collective entries
2815	**N-Aminoethylpiperazine**		8	C7	III	Mixture of hydrocarbons **and** wetting solution
2818	**Ammonium polysulphide solution**	aqueous solution	8	CT1	II/III	Acetic acid
2819	**Amyl acid phosphate**		8	C3	III	Wetting solution
2820	**Butyric acid**	n-Butyric acid	8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2821	**Phenol solution**	aqueous solution, toxic, non-alkaline	6.1	T1	II/III	Acetic acid
2829	**Caproic acid**	n-Caproic acid	8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2837	**Bisulphates, aqueous solution**		8	C1	II/III	Water
2838	**Vinyl butyrate, stabilized**		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2841	**Di-n-amylamine**		3	FT1	III	Mixture of hydrocarbons **and** wetting solution
2850	**Propylene tetramer**	mixture of C12-monoolefines, flashpoint between 23 °C and 60 °C	3	F1	III	Mixture of hydrocarbons
2873	**Dibutylaminoethanol**	N,N-Di-n-butylaminoethanol	6.1	T1	III	Acetic acid
2874	**Furfuryl alcohol**		6.1	T1	III	Acetic acid
2920	O,O-Diethyl-dithiophosphoric acid	flashpoint between 23 °C and 60 °C	8	CF1	II	n-Butyl acetate/n-butyl acetate-saturated wetting solution
2920	O,O-Dimethyl-dithiophosphoric acid	flashpoint between 23 °C and 60 °C	8	CF1	II	Wetting solution
2920	Hydrogen bromide	33% solution in glacial acetic acid	8	CF1	II	Wetting solution

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
2920	Tetramethylammonium hydroxide	aqueous solution, flash-point between 23 °C and 60 °C	8	CF1	II	Water
2920	**Corrosive liquid, flammable, n.o.s.**		8	CF1	I/II	Rule for collective entries
2922	Ammonium sulphide	aqueous solution, flash-point more than 60 °C	8	CT1	II	Water
2922	Cresols	aqueous alkaline solution, mixture of sodium and potassium cresolate	8	CT1	II	Acetic acid
2922	Phenol	aqueous alkaline solution, mixture of sodium and potassium phenolate	8	CT1	II	Acetic acid
2922	Sodium hydrogen difluoride	aqueous solution	8	CT1	III	Water
2922	**Corrosive liquid, toxic, n.o.s.**		8	CT1	I/II/III	Rule for collective entries
2924	**Flammable liquid, corrosive, n.o.s.**	slightly corrosive	3	FC	I/II/III	Rule for collective entries
2927	**Toxic liquid, corrosive, organic, n.o.s.**		6.1	TC1	I/II	Rule for collective entries
2933	**Methyl 2-chloropropionate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2934	**Isopropyl 2-chloropropionate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2935	**Ethyl 2-chloropropionate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2936	**Thiolactic acid**		6.1	T1	II	Acetic acid
2941	**Fluoroanilines**	pure isomers and isomeric mixture	6.1	T1	III	Acetic acid
2943	**Tetrahydrofurfurylamine**		3	F1	III	Mixture of hydrocarbons
2945	**N-Methylbutylamine**		3	FC	II	Mixture of hydrocarbons **and** wetting solution
2946	**2-Amino-5-diethylaminopentane**		6.1	T1	III	Mixture of hydrocarbons **and** wetting solution
2947	**Isopropyl chloroacetate**		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
2984	**Hydrogen peroxide, aqueous solution**	with not less than 8% but less than 20% hydrogen peroxide, stabilized as necessary	5.1	O1	III	Nitric acid
3056	**n-Heptaldehyde**		3	F1	III	Mixture of hydrocarbons
3065	**Alcoholic beverages**	with more than 24% alcohol by volume	3	F1	II/III	Acetic acid
3066	**Paint** or **Paint related material**	including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base or including paint thinning and reducing compound	8	C9	II/III	Rule for collective entries
3079	**Methacrylonitrile, stabilized**		3	FT1	I	n-Butyl acetate/ n-butyl acetate-saturated wetting solution

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classifi-cation code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
3082	sec-Alcohol C_6-C_{17} poly (3-6) ethoxylate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
3082	Alcohol C_{12}-C_{15} poly (1-3) ethoxylate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
3082	Alcohol C_{13}-C_{15} poly (1-6) ethoxylate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
3082	Aviation turbine fuel JP-5	flashpoint more than 60 °C	9	M6	III	Mixture of hydrocarbons
3082	Aviation turbine fuel JP-7	flashpoint more than 60 °C	9	M6	III	Mixture of hydrocarbons
3082	Coal tar	flashpoint more than 60 °C	9	M6	III	Mixture of hydrocarbons
3082	Coal tar naphtha	flashpoint more than 60 °C	9	M6	III	Mixture of hydrocarbons
3082	Creosote produced of coal tar	flashpoint more than 60 °C	9	M6	III	Mixture of hydrocarbons
3082	Creosote produced of wood tar	flashpoint more than 60 °C	9	M6	III	Mixture of hydrocarbons
3082	Cresyl diphenyl phosphate		9	M6	III	Wetting solution
3082	Decyl acrylate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
3082	Diisobutyl phthalate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
3082	Di-n-butyl phthalate		9	M6	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons
3082	Hydrocarbons	liquid, flashpoint more than 60 °C, environmen-tally hazardous	9	M6	III	Rule for collective entries
3082	Isodecyl diphenyl phosphate		9	M6	III	Wetting solution
3082	Methylnaphthalenes	isomeric mixture, liquid	9	M6	III	Mixture of hydrocarbons
3082	Triaryl phosphates	n.o.s.	9	M6	III	Wetting solution
3082	Tricresyl phosphate	with not more than 3% ortho-isomer	9	M6	III	Wetting solution
3082	Trixylenyl phosphate		9	M6	III	Wetting solution
3082	Zinc alkyl dithiophosphate	C3-C14	9	M6	III	Wetting solution
3082	Zinc aryl dithiophosphate	C7-C16	9	M6	III	Wetting solution
3082	**Environmentally hazardous substance, liquid, n.o.s.**		9	M6	III	Rule for collective entries
3099	**Oxidizing liquid, toxic, n.o.s.**		5.1	OT1	I/II/III	Rule for collective entries

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
3101 3103 3105 3107 3109 3111 3113 3115 3117 3119	**Organic Peroxide, Type B, C, D, E** or **F, liquid** or **Organic Peroxide, Type B, C, D, E** or **F, liquid, temperature controlled**		5.2	P1		n-Butyl acetate/ n-butyl acetate-saturated wetting solution **and** mixture of hydrocarbons **and** nitric acid(**)
(**) For UN Nos. 3101, 3103, 3105, 3107, 3109, 3111, 3113, 3115, 3117, 3119 (tert-butyl hydroperoxide with more than 40 % peroxide content and peroxyacetic acids are excluded): All organic peroxides in a technically pure form or in solution in solvents which, as far as their compatibility is concerned, are covered by the standard liquid "mixture of hydrocarbons" in this list. Compatibility of vents and gaskets with organic peroxides may be verified, also independently of the design type test, by laboratory tests with nitric acid. Organic peroxides of UN Nos 3111, 3113, 3115, 3117 and 3119 are not accepted for carriage by rail.						
3145	Butylphenols	liquid, n.o.s.	8	C3	I/II/III	Acetic acid
3145	**Alkylphenols, liquid, n.o.s.**	including C2 to C12 homologues	8	C3	I/II/III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3149	**Hydrogen peroxide and peroxyacetic acid mixture, stabilized**	with UN 2790 acetic acid, UN 2796 sulphuric acid and/or UN 1805 phosphoric acid, water and not more than 5% peroxyacetic acid	5.1	OC1	II	Wetting solution **and** nitric acid
3210	**Chlorates, inorganic, aqueous solution, n.o.s.**		5.1	O1	II/III	Water
3211	**Perchlorates, inorganic, aqueous solution, n.o.s.**		5.1	O1	II/III	Water
3213	**Bromates, inorganic, aqueous solution, n.o.s.**		5.1	O1	II/III	Water
3214	**Permanganates, inorganic, aqueous solution, n.o.s.**		5.1	O1	II	Water
3216	**Persulphates, inorganic, aqueous solution, n.o.s.**		5.1	O1	III	Wetting solution
3218	**Nitrates, inorganic, aqueous solution, n.o.s.**		5.1	O1	II/III	Water
3219	**Nitrites, inorganic, aqueous solution, n.o.s.**		5.1	O1	II/III	Water
3264	Cupric chloride	aqueous solution, slightly corrosive	8	C1	III	Water
3264	Hydroxylamine sulphate	25% aqueous solution	8	C1	III	Water
3264	Phosphorous acid	aqueous solution	8	C1	III	Water
3264	**Corrosive liquid, acidic, inorganic, n.o.s.**	flashpoint more than 60 °C	8	C1	I/II/III	Rule for collective entries; not applicable to mixtures having components of UN Nos.: 1830, 1832, 1906 and 2308
3265	Methoxyacetic acid		8	C3	I	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3265	Allyl succinic acid anhydride		8	C3	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3265	Dithioglycolic acid		8	C3	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
3265	Butyl phosphate	mixture of mono- and di-butyl phosphate	8	C3	III	Wetting solution
3265	Caprylic acid		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3265	Isovaleric acid		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3265	Pelargonic acid		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3265	Pyruvic acid		8	C3	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3265	Valeric acid		8	C3	III	Acetic acid
3265	**Corrosive liquid, acidic, organic, n.o.s.**	flashpoint more than 60 °C	8	C3	I/II/III	Rule for collective entries
3266	Sodium hydrosulphide	aqueous solution	8	C5	II	Acetic acid
3266	Sodium sulphide	aqueous solution, slightly corrosive	8	C5	III	Acetic acid
3266	**Corrosive liquid, basic, inorganic, n.o.s.**	flashpoint more than 60 °C	8	C5	I/II/III	Rule for collective entries
3267	2,2'-(Butylimino)-bisethanol		8	C7	II	Mixture of hydrocarbons **and** wetting solution
3267	**Corrosive liquid, basic, organic, n.o.s.**	flashpoint more than 60 °C	8	C7	I/II/III	Rule for collective entries
3271	Ethylene glycol monobutyl ether	flashpoint 60 °C	3	F1	III	Acetic acid
3271	**Ether, n.o.s.**		3	F1	II/III	Rule for collective entries
3272	Acrylic acid tert-butyl ester		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	Isobutyl propionate	flashpoint below 23 °C	3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	Methyl valerate		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	Trimethyl ortho-formate		3	F1	II	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	Ethyl valerate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	Isobutyl isovalerate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	n-Amyl propionate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	n-Butylbutyrate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	Methyl lactate		3	F1	III	n-Butyl acetate/ n-butyl acetate-saturated wetting solution
3272	**Ester, n.o.s.**		3	F1	II/III	Rule for collective entries
3287	Sodium nitrite	40% aqueous solution	6.1	T4	III	Water
3287	**Toxic liquid, inorganic, n.o.s.**		6.1	T4	I/II/III	Rule for collective entries

UN No.	Proper shipping name or technical name 3.1.2	Description 3.1.2	Class 2.2	Classification code 2.2	Packing group 2.1.1.3	Standard liquid
(1)	(2a)	(2b)	(3a)	(3b)	(4)	(5)
3291	**Clinical waste, unspecified, n.o.s.**	liquid	6.2	I3	II	Water
3293	**Hydrazine, aqueous solution**	with not more than 37% hydrazine, by mass	6.1	T4	III	Water
3295	Heptenes	n.o.s.	3	F1	II	Mixture of hydrocarbons
3295	Nonanes	flashpoint below 23 °C	3	F1	II	Mixture of hydrocarbons
3295	Decanes	n.o.s.	3	F1	III	Mixture of hydrocarbons
3295	1,2,3-Trimethylbenzene		3	F1	III	Mixture of hydrocarbons
3295	**Hydrocarbons, liquid, n.o.s.**		3	F1	I/II/III	Rule for collective entries
3405	**Barium chlorate, solution**	aqueous solution	5.1	OT1	II/III	Water
3406	**Barium perchlorate, solution**	aqueous solution	5.1	OT1	II/III	Water
3408	**Lead perchlorate, solution**	aqueous solution	5.1	OT1	II/III	Water
3413	**Potassium cyanide, solution**	aqueous solution	6.1	T4	I/II/III	Water
3414	**Sodium cyanide, solution**	aqueous solution	6.1	T4	I/II/III	Water
3415	**Sodium fluoride, solution**	aqueous solution	6.1	T4	III	Water
3422	**Potassium fluoride, solution**	aqueous solution	6.1	T4	III	Water

4.1.2 Additional general provisions for the use of IBCs

4.1.2.1 When IBCs are used for the carriage of liquids with a flashpoint of 60 °C (closed cup) or lower, or of powders liable to dust explosion, measures shall be taken to prevent a dangerous electrostatic discharge.

4.1.2.2 Every metal, rigid plastics and composite IBC, shall be inspected and tested, as relevant, in accordance with 6.5.4.4 or 6.5.4.5:

– before it is put into service;

– thereafter at intervals not exceeding two and a half and five years, as appropriate;

– after the repair or remanufacture, before it is re-used for carriage.

An IBC shall not be filled and offered for carriage after the date of expiry of the last periodic test or inspection. However, an IBC filled prior to the date of expiry of the last periodic test or inspection may be carried for a period not to exceed three months beyond the date of expiry of the last periodic test or inspection. In addition, an IBC may be carried after the date of expiry of the last periodic test or inspection:

(a) after emptying but before cleaning, for purposes of performing the required test or inspection prior to refilling; and

(b) unless otherwise approved by the competent authority, for a period not to exceed six months beyond the date of expiry of the last periodic test or inspection in order to allow the return of dangerous goods or residues for proper disposal or recycling.

NOTE: For the particulars in the transport document, see 5.4.1.1.11.

4.1.2.3 IBCs of type 31HZ2 shall be filled to at least 80% of the volume of the outer casing.

4.1.2.4 Except for routine maintenance of metal, rigid plastics, composite and flexible IBCs performed by the owner of the IBC, whose State and name or authorized symbol is durably marked on the IBC, the party performing routine maintenance shall durably mark the IBC near the manufacturer's UN design type marking to show:

(a) The State in which the routine maintenance was carried out; and

(b) The name or authorized symbol of the party performing the routine maintenance.

4.1.3 General provisions concerning packing instructions

4.1.3.1 Packing instructions applicable to dangerous goods of Classes 1 to 9 are specified in Section 4.1.4. They are subdivided in three sub-sections depending on the type of packagings to which they apply:

Sub-section 4.1.4.1 for packagings other than IBCs and large packagings; these packing instructions are designated by an alphanumeric code starting with the letter "P" or "R" for packagings specific to RID and ADR;

Sub-section 4.1.4.2 for IBCs; these are designated by an alphanumeric code starting with the letters "IBCs";

Sub-section 4.1.4.3 for large packagings; these are designated by an alphanumeric code starting with the letters "LP".

Generally, packing instructions specify that the general provisions of 4.1.1, 4.1.2 or 4.1.3, as appropriate, are applicable. They may also require compliance with the special provisions of Sections 4.1.5, 4.1.6, 4.1.7, 4.1.8 or 4.1.9 when appropriate. Special packing provisions may also be specified in the packing instruction for individual substances or articles. They are also designated by an alphanumeric code comprising the letters:

"PP" for packagings other than IBCs and large packagings, or "RR" for special provisions specific to RID and ADR;

"B" for IBCs or "BB" for special packing provisions specific to RID and ADR;

"L" for large packagings.

Unless otherwise specified, each packaging shall conform to the applicable requirements of Part 6. Generally packing instructions do not provide guidance on compatibility and the user shall not select a packaging without checking that the substance is compatible with the packaging material selected (e.g. glass receptacles are unsuitable for most fluorides). Where glass receptacles are permitted in the packing instructions porcelain, earthenware and stoneware packagings are also allowed.

4.1.3.2 Column (8) of Table A of Chapter 3.2 shows for each article or substance the packing instruction(s) that shall be used. Columns (9a) and (9b) indicate the special packing provisions and the mixed packing provisions (see 4.1.10) applicable to specific substances or articles.

4.1.3.3 Each packing instruction shows, where applicable, the acceptable single and combination packagings. For combination packagings, the acceptable outer packagings, inner packagings and when applicable the maximum quantity permitted in each inner or outer packaging, are shown. Maximum net mass and maximum capacity are as defined in 1.2.1.

4.1.3.4 The following packagings shall not be used when the substances being carried are liable to become liquid during carriage:

Packagings	
Drums:	1D and 1G
Boxes:	4A, 4B, 4C1, 4C2, 4D, 4F, 4G, 4H1 and 4H2
Bags:	5L1, 5L2, 5L3, 5H1, 5H2, 5H3, 5H4, 5M1 and 5M2
Composite packagings:	6HC, 6HD2, 6HG1, 6HG2, 6HD1, 6PC, 6PD1, 6PD2, 6PG1, 6PG2 and 6PH1
Large packagings	
Flexible plastics:	51H (outer packaging)
IBCs	
For substances of packing group I:	All types of IBC
For substances of packing groups II and III:	
Wooden:	11C, 11D and 11F
Fibreboard:	11G
Flexible:	13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2
Composite:	11HZ2 and 21HZ2

For the purposes of this paragraph, substances and mixtures of substances having a melting point equal to or less than 45 °C shall be treated as solids liable to become liquid during transport.

4.1.3.5 Where the packing instructions in this Chapter authorize the use of a particular type of packaging (e.g. 4G, 1A2), packagings bearing the same packaging identification code followed by the letters "V", "U" or "W" marked in accordance with the requirements of Part 6 (e.g. 4GV, 4GU or 4GW; 1A2V, 1A2U or 1A2W) may also be used under the same conditions and limitations applicable to the use of that type of packaging according to the relevant packing instructions. For example, a combination packaging marked with the packaging code "4GV" may be used whenever a combination packaging marked "4G" is authorized, provided the requirements in the relevant packing instruction regarding types of inner packagings and quantity limitations are respected.

4.1.3.6 Pressure receptacles for liquids and solids

4.1.3.6.1 Unless otherwise indicated in RID, pressure receptacles conforming to:

(a) the applicable requirements of Chapter 6.2 or

(b) the national or international standards on the design, construction, testing, manufacturing and inspection, as applied by the country in which the pressure receptacles are manufactured, provided that the provisions of 4.1.3.6 are met and that, for metallic cylinders, tubes, pressure drums and bundles of cylinders, the construction is such that the minimum burst ratio (burst pressure divided by test pressure) is:

(i) 1.50 for refillable pressure receptacles;

(ii) 2.00 for non-refillable pressure receptacles;

are authorized for the carriage of any liquid or solid substance other than explosives, thermally unstable substances, organic peroxides, self-reactive substances, substances where significant pressure may develop by evolution of chemical reaction and radioactive material (unless permitted in 4.1.9).

This sub-section is not applicable to the substances mentioned in 4.1.4.1, packing instruction P200, table 3.

4.1.3.6.2 Every design type of pressure receptacle shall be approved by the competent authority of the country of manufacture or as indicated in Chapter 6.2.

4.1.3.6.3 Unless otherwise indicated, pressure receptacles having a minimum test pressure of 0.6 MPa shall be used.

4.1.3.6.4 Unless otherwise indicated, pressure receptacles may be provided with an emergency pressure relief device designed to avoid bursting in case of overfill or fire accidents.

Pressure receptacle valves shall be designed and constructed in such a way that they are inherently able to withstand damage without release of the contents or shall be protected from damage which could cause inadvertent release of the contents of the pressure receptacle, by one of the methods as given in 4.1.6.8 (a) to (e).

4.1.3.6.5 The level of filling shall not exceed 95% of the capacity of the pressure receptacle at 50 °C. Sufficient ullage (outage) shall be left to ensure that the pressure receptacle will not be liquid full at a temperature of 55 °C.

4.1.3.6.6 Unless otherwise indicated pressure receptacles shall be subjected to a periodic inspection and test every 5 years. The periodic inspection shall include an external examination, an internal examination or alternative method as approved by the competent authority, a pressure test or equivalent effective non-destructive testing with the agreement of the competent authority including an inspection of all accessories (e.g. tightness of valves, emergency relief valves or fusible elements). Pressure receptacles shall not be filled after they become due for periodic inspection and test but may be carried after the expiry of the time limit. Pressure receptacle repairs shall meet the requirements of 4.1.6.11.

4.1.3.6.7 Prior to filling, the packer shall perform an inspection of the pressure receptacle and ensure that the pressure receptacle is authorized for the substances to be carried and that the requirements of RID have been met. Shut-off valves shall be closed after filling and remain closed during carriage. The consignor shall verify that the closures and equipment are not leaking.

4.1.3.6.8 Refillable pressure receptacles shall not be filled with a substance different from that previously contained unless the necessary operations for change of service have been performed.

4.1.3.6.9 Marking of pressure receptacles for liquids and solids according to 4.1.3.6 (not conforming to the requirements of Chapter 6.2) shall be in accordance with the requirements of the competent authority of the country of manufacturing.

4.1.3.7 Packagings or IBCs not specifically authorized in the applicable packing instruction shall not be used for the carriage of a substance or article unless specifically allowed under a temporary derogation agreed between COTIF Member States in accordance with 1.5.1.

4.1.3.8 Unpackaged articles other than Class 1 articles

4.1.3.8.1 Where large and robust articles cannot be packaged in accordance with the requirements of Chapters 6.1 or 6.6 and they have to be carried empty, uncleaned and unpackaged, the competent authority of the country of origin[2] may approve such carriage. In doing so the competent authority shall take into account that:

(a) Large and robust articles shall be strong enough to withstand the shocks and loadings normally encountered during carriage including trans-shipment between transport units and between transport units and warehouses, as well as any removal from a pallet for subsequent manual or mechanical handling;

(b) All closures and openings shall be sealed so that there can be no loss of contents which might be caused under normal conditions of carriage, by vibration, or by changes in temperature, humidity or pressure (resulting from altitude, for example). No dangerous residue shall adhere to the outside of the large and robust articles;

(c) Parts of large and robust articles, which are in direct contact with dangerous goods:

(i) shall not be affected or significantly weakened by those dangerous goods; and

(ii) shall not cause a dangerous effect e.g. catalysing a reaction or reacting with the dangerous goods;

(d) Large and robust articles containing liquids shall be stowed and secured to ensure that neither leakage nor permanent distortion of the article occurs during carriage;

(e) They shall be fixed in cradles or crates or other handling devices or to the wagon or container in such a way that they will not become loose during normal conditions of carriage.

4.1.3.8.2 Unpackaged articles approved by the competent authority in accordance with the provisions of 4.1.3.8.1 shall be subject to the consignment procedures of Part 5. In addition the consignor of such articles shall ensure that a copy of any such approval is attached to the transport document.

NOTE: A large and robust article may include flexible fuel containment systems, military equipment, machinery or equipment containing dangerous goods above the limited quantities according to 3.4.6.

[2] If the country of origin is not a COTIF Member State, the competent authority of the first COTIF Member State reached by the consignment.

4.1.4 List of packing instructions

NOTE: Although the following packing instructions use the same numbering system as used in the IMDG Code and the UN Model Regulations, readers should be aware that some of the details may be different in the case of RID.

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

P 001	**PACKING INSTRUCTION (LIQUIDS)**			**P 001**
The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met:				
Combination packagings		**Maximum capacity/Net mass (see 4.1.3.3)**		
Inner packagings	**Outer packagings**	**Packing group I**	**Packing group II**	**Packing group III**
Glass 10 l Plastics 30 l Metal 40 l	**Drums**			
	steel (1A2)	250 kg	400 kg	400 kg
	aluminium (1B2)	250 kg	400 kg	400 kg
	metal other than steel or aluminium (1N2)	250 kg	400 kg	400 kg
	plastics (1H2)	250 kg	400 kg	400 kg
	plywood (1D)	150 kg	400 kg	400 kg
	fibre (1G)	75 kg	400 kg	400 kg
	Boxes			
	steel (4A)	250 kg	400 kg	400 kg
	aluminium (4B)	250 kg	400 kg	400 kg
	natural wood (4C1, 4C2)	150 kg	400 kg	400 kg
	plywood (4D)	150 kg	400 kg	400 kg
	reconstituted wood (4F)	75 kg	400 kg	400 kg
	fibreboard (4G)	75 kg	400 kg	400 kg
	expanded plastics (4H1)	60 kg	60 kg	60 kg
	solid plastics (4H2)	150 kg	400 kg	400 kg
	Jerricans			
	steel (3A2)	120 kg	120 kg	120 kg
	aluminium (3B2)	120 kg	120 kg	120 kg
	plastics (3H2)	120 kg	120 kg	120 kg
Single packagings				
Drums				
steel, non-removable head (1A1)		250 l	450 l	450 l
steel, removable head (1A2)		250 l[(a)]	450 l	450 l
aluminium, non-removable head (1B1)		250 l	450 l	450 l
aluminium, removable head (1B2)		250 l[(a)]	450 l	450 l
metal other than steel or aluminium, non-removable head (1N1)		250 l	450 l	450 l
metal other than steel or aluminium, removable head (1N2)		250 l[(a)]	450 l	450 l
plastics, non-removable head (1H1)		250 l	450 l	450 l
plastics, removable head (1H2)		250 l[(a)]	450 l	450 l
Jerricans				
steel, non-removable head (3A1)		60 l	60 l	60 l
steel, removable head (3A2)		60 l[(a)]	60 l	60 l
aluminium, non-removable head (3B1)		60 l	60 l	60 l
aluminium, removable head (3B2)		60 l[(a)]	60 l	60 l
plastics, non-removable head (3H1)		60 l	60 l	60 l
plastics, removable head (3H2)		60 l[(a)]	60 l	60 l

Single packagings (cont'd)			
Composite packagings			
plastics receptacle with outer steel or aluminium drum (6HA1, 6HB1)	250 l	250 l	250 l
plastics receptacle with outer fibre, plastics or plywood drum (6HG1, 6HH1, 6HD1)	120 l	250 l	250 l
plastics receptacle with outer steel or aluminium crate or box or plastics receptacle with outer wooden, plywood, fibreboard or solid plastics box (6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2)	60 l	60 l	60 l
glass receptacle with outer steel, aluminium, fibreboard, plywood, solid plastics or expanded plastics drum (6PA1, 6PB1, 6PG1, 6PD1, 6PH1 or 6PH2) or with outer steel or aluminium crate or box or with outer wooden or fibreboard box or with outer wickerwork hamper (6PA2, 6PB2, 6PC, 6PG2 or 6PD2)	60 l	60 l	60 l
Pressure receptacles, provided that the general provisions of 4.1.3.6 are met.			

Additional requirement

For substances of Class 3, packing group III, which give off small quantities of carbon dioxide or nitrogen, the packagings shall be vented.

Special packing provisions

PP 1	For UN Nos. 1133, 1210, 1263 and 1866 and for adhesives, printing inks, printing ink related materials, paints, paint related materials and resin solutions which are assigned to UN 3082, metal or plastics packagings for substances of packing groups II and III in quantities of 5 litres or less per packaging are not required to meet the performance tests in Chapter 6.1 when carried: (a) in palletized loads, a pallet box or unit load device, e.g. individual packagings placed or stacked and secured by strapping, shrink or stretch-wrapping or other suitable means to a pallet; or (b) as inner packagings of combination packagings with a maximum net mass of 40 kg.
PP 2	For UN No. 3065, wooden barrels with a maximum capacity of 250 litres and which do not meet the provisions of Chapter 6.1 may be used.
PP 4	For UN No. 1774, packagings shall meet the packing group II performance level.
PP 5	For UN No. 1204, packagings shall be so constructed that explosion is not possible by reason of increased internal pressure. Cylinders, tubes and pressure drums shall not be used for these substances.
PP 6	(Deleted)
PP 10	For UN No. 1791, packing group II, the packaging shall be vented.
PP 31	For UN No. 1131, packagings shall be hermetically sealed.
PP 33	For UN No. 1308, packing groups I and II, only combination packagings with a maximum gross mass of 75 kg allowed.
PP 81	For UN No. 1790 with more than 60% but not more than 85% hydrogen fluoride and UN No. 2031 with more than 55% nitric acid, the permitted use of plastics drums and jerricans as single packagings shall be two years from their date of manufacture.

Special packing provision specific to RID and ADR

RR 2	For UN No. 1261, removable head packagings are not permitted.

(a) Only substances with a viscosity of more than 2 680 mm^2/s are authorized.

P 002	PACKING INSTRUCTION (SOLIDS)	P 002

The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met:

Combination packagings		Maximum net mass (see 4.1.3.3)		
Inner packagings	**Outer packagings**	**Packing group I**	**Packing group II**	**Packing group III**
Glass 10 kg Plastics[(a)] 50 kg Metal 50 kg Paper[(a),(b),(c)] 50 kg Fibre [(a),(b),(c)] 50 kg [(a)] These inner packagings shall be sift-proof. [(b)] These inner packagings shall not be used when the substances being carried may become liquid during carriage (see 4.1.3.4). [(c)] These inner packagings shall not be used for substances of packing group I.	**Drums**			
	steel (1A2)	400 kg	400 kg	400 kg
	aluminium (1B2)	400 kg	400 kg	400 kg
	metal, other than steel or aluminium (1N2)	400 kg	400 kg	400 kg
	plastics (1H2)	400 kg	400 kg	400 kg
	plywood (1D)	400 kg	400 kg	400 kg
	fibre (1G)	400 kg	400 kg	400 kg
	Boxes			
	steel (4A)	400 kg	400 kg	400 kg
	aluminium (4B)	400 kg	400 kg	400 kg
	natural wood (4C1)	250 kg	400 kg	400 kg
	natural wood with sift proof walls (4C2)	250 kg	400 kg	400 kg
	plywood (4D)	250 kg	400 kg	400 kg
	reconstituted wood (4F)	125 kg	400 kg	400 kg
	fibreboard (4G)	125 kg	400 kg	400 kg
	expanded plastics (4H1)	60 kg	60 kg	60 kg
	solid plastics (4H2)	250 kg	400 kg	400 kg
	Jerricans			
	steel (3A2)	120 kg	120 kg	120 kg
	aluminium (3B2)	120 kg	120 kg	120 kg
	plastics (3H2)	120 kg	120 kg	120 kg

Single packagings			
Drums			
steel (1A1 oder 1A2[(d)])	400 kg	400 kg	400 kg
aluminium (1B1 oder 1B2[(d)])	400 kg	400 kg	400 kg
metal, other than steel or aluminium (1N1 oder 1N2[(d)])	400 kg	400 kg	400 kg
plastics (1H1 oder 1H2[(d)])	400 kg	400 kg	400 kg
fibre (1G)[(e)]	400 kg	400 kg	400 kg
plywood (1D)[(e)]	400 kg	400 kg	400 kg
Jerricans			
steel (3A1 oder 3A2[(d)])	120 kg	120 kg	120 kg
aluminium (3B1 oder 3B2[(d)])	120 kg	120 kg	120 kg
plastics (3H1 oder 3H2[(d)])	120 kg	120 kg	120 kg
Boxes			
steel (4A)[(e)]	Not allowed	400 kg	400 kg
aluminium (4B)[(e)]	Not allowed	400 kg	400 kg
natural wood (4C1)[(e)]	Not allowed	400 kg	400 kg
plywood (4D)[(e)]	Not allowed	400 kg	400 kg
reconstituted wood (4F)[(e)]	Not allowed	400 kg	400 kg
natural wood with sift-proof walls (4C2)[(e)]	Not allowed	400 kg	400 kg
fibreboard (4G)[(e)]	Not allowed	400 kg	400 kg
solid plastics (4H2)[(e)]	Not allowed	400 kg	400 kg
Bags			
bags (5H3, 5H4, 5L3, 5M2)[(e)]	Not allowed	50 kg	50 kg

[(d)] These packagings shall not be used for substances of packing group I that may become liquid during carriage (see 4.1.3.4).

[(e)] These packagings shall not be used when substances being carried may become liquid during carriage (see 4.1.3.4).

Single packagings (cont'd)			
Composite packagings			
plastics receptacle with outer steel, aluminium, plywood, fibre or plastics drum (6HA1, 6HB1, 6HG1[(e)], 6HD1[(e)] or 6HH1)	400 kg	400 kg	400 kg
plastics receptacle with outer steel or aluminium crate or box, wooden box, plywood box, fibreboard box or solid plastics box (6HA2, 6HB2, 6HC, 6HD2[(e)], 6HG2[(e)] or 6HH2)	75 kg	75 kg	75 kg
glass receptacle with outer steel, aluminium plywood or fibre drum (6PA1, 6PB1, 6PD1[(e)] or 6PG1[(e)]) or with outer steel or aluminium crate or box or with outer wooden, or fibreboard box or with outer wickerwork hamper (6PA2, 6PB2, 6PC, 6PG2[(e)] or 6PD2[(e)]) or with outer solid plastics or expanded plastics packaging (6PH2 or 6PH1[(e)])	75 kg	75 kg	75 kg
[(e)] These packagings shall not be used when the substances being carried may become liquid during carriage (see 4.1.3.4).			
Pressure receptacles, provided that the general provisions of 4.1.3.6 are met.			

Special packing provisions	
PP 6	(Deleted)
PP 7	For UN No. 2000, celluloid may also be transported unpacked on pallets, wrapped in plastic film and secured by appropriate means, such as steel bands as a wagon load or as a full load in covered wagons or in closed containers. Each pallet shall not exceed 1 000 kg.
PP 8	For UN No. 2002, packagings shall be so constructed that explosion is not possible by reason of increased internal pressure. Cylinders, tubes and pressure drums shall not be used for these substances.
PP 9	For UN Nos. 3175, 3243 and 3244, packagings shall conform to a design type that has passed a leakproofness test at the packing group II performance level. For UN No. 3175, the leakproofness test is not required when the liquids are fully absorbed in solid material contained in sealed bags.
PP 11	For UN No. 1309, packing group III, and UN No. 1362, 5H1, 5L1 and 5M1 bags are allowed if they are overpacked in plastic bags and are wrapped in shrink or stretch wrap on pallets.
PP 12	For UN Nos. 1361, 2213 and UN No. 3077, 5H1, 5L1 and 5M1 bags are allowed when carried in covered wagons or closed containers.
PP 13	For articles classified under UN No. 2870, only combination packagings meeting the packing group I performance level are authorized.
PP 14	For UN Nos. 2211, 2698 and 3314, packagings are not required to meet the performance tests in Chapter 6.1.
PP 15	For UN Nos. 1324 and 2623, packagings shall meet the packing group III performance level.
PP 20	For UN No. 2217, any sift-proof, tearproof receptacle may be used.
PP 30	For UN No. 2471, paper or fibre inner packagings are not permitted.
PP 34	For UN No. 2969 (as whole beans), 5H1, 5L1 and 5M1 bags are permitted.
PP 37	For UN Nos. 2590 and 2212, 5M1 bags are permitted. All bags of any type shall be carried in closed wagons or containers or be placed in closed rigid overpacks.
PP 38	For UN No. 1309, packing group II, bags are permitted only in covered wagons or closed containers.
PP 84	For UN No. 1057, rigid outer packagings meeting the packing group II performance level shall be used. The packagings shall be designed and constructed and arranged to prevent movement, inadvertent ignition of the devices or inadvertent release of flammable gas or liquid. **NOTE:** For waste lighters collected separately see Chapter 3.3, special provision 654.
Special packing provision specific to RID and ADR	
RR 5	Notwithstanding special packing provision PP84, only the general provi-sions of 4.1.1.1, 4.1.1.2 and 4.1.1.5 to 4.1.1.7 need be complied with if the gross mass of the package is not more than 10 kg. **NOTE:** For waste lighters collected separately see Chapter 3.3, special provision 654.

P 003	PACKING INSTRUCTION	P 003

Dangerous goods shall be placed in suitable outer packagings. The packagings shall meet the provisions of 4.1.1.1, 4.1.1.2, 4.1.1.4, 4.1.1.8 and 4.1.3 and be so designed that they meet the construction requirements of 6.1.4. Outer packagings constructed of suitable material of adequate strength and design in relation to the packaging capacity and its intended use shall be used. Where this packing instruction is used for the transport of articles or inner packagings of combination packagings, the packaging shall be designed and constructed to prevent inadvertent discharge of articles during normal conditions of carriage.

Special packing provisions

PP 16	For UN No. 2800, batteries shall be protected from short circuits and shall be securely packed in strong outer packagings. **NOTE 1:** Non-spillable batteries which are an integral part of, and necessary for, the operation of mechanical or electronic equipment shall be securely fastened in the battery holder on the equipment and protected in such a manner as to prevent damage and short circuits. **2:** For used batteries (UN No. 2800), see P801a.
PP 17	For UN Nos. 1950 and 2037, packages shall not exceed 55 kg net mass for fibreboard packagings or 125 kg net mass for other packagings.
PP 19	For UN Nos. 1364 and 1365, carriage as bales is authorized.
PP 20	For UN Nos. 1363, 1386, 1408 and 2793 any sift-proof, tearproof receptacle may be used.
PP 32	UN Nos. 2857 and 3358 may be carried unpackaged, in crates or in appropriate overpacks.
PP 87	For UN 1950 waste aerosols carried in accordance with special provision 327, the packagings shall have a means of retaining any free liquid that might escape during carriage, e.g. absorbent material. The packaging shall be adequately ventilated to prevent the creation of flammable atmosphere and the build-up of pressure.
PP 88	(Deleted)

Special packing provision specific to RID and ADR

RR 6	For UN Nos. 1950 and 2037, in the case of carriage by wagon load or full load, metal articles may also be packed as follows: The articles shall be grouped together in units on trays and held in position with an appropriate plastics cover; these units shall be stacked and suitably secured on pallets.

P 004	PACKING INSTRUCTION	P 004

This instruction applies to UN Nos. 3473, 3476, 3477, 3478 and 3479.

The following packagings are authorized provided the general provisions of 4.1.1.1, 4.1.1.2, 4.1.1.3, 4.1.1.6 and 4.1.3 are met:

(1) For fuel cell cartridges, packagings conforming to the packing group II performance level; and

(2) For fuel cell cartridges contained in equipment or packed with equipment, strong outer packagings. Large robust equipment (see 4.1.3.8) containing fuel cell cartridges may be carried unpackaged. When fuel cell cartridges are packed with equipment, they shall be packed in inner packagings or placed in the outer packaging with cushioning material or divider(s) so that the fuel cell cartridges are protected against damage that may be caused by the movement or placement of the contents within the outer packaging. Fuel cell cartridges which are installed in equipment shall be protected against short circuit and the entire system shall be protected against inadvertent operation.

P 010	PACKING INSTRUCTION	P 010
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
Combination packagings		**Maximum net mass (see 4.1.3.3)**
Inner packagings	**Outer packagings**	
Glass 1 l Steel 40 l	**Drums** steel (1A2) plastics (1H2) plywood (1D) fibre (1G)	 400 kg 400 kg 400 kg 400 kg
	Boxes steel (4A) natural wood (4C1, 4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) expanded plastics (4H1) solid plastics (4H2)	 400 kg 400 kg 400 kg 400 kg 400 kg 60 kg 400 kg
Single packagings		**Maximum capacity (see 4.1.3.3)**
Drums steel, non-removable head (1A1)		 450 l
Jerricans steel, non-removable head (3A1)		 60 l
Composite packagings plastics receptacle in steel drums (6HA1)		 250 l

P 099	PACKING INSTRUCTION	P 099
Only packagings which are approved for these goods by the competent authority may be used. A copy of the competent authority approval shall accompany each consignment or the transport document shall include an indication that the packaging was approved by the competent authority.		

P 101	PACKING INSTRUCTION	P 101

Only packagings which are approved by the competent authority of the country of origin may be used. If the country of origin is not a COTIF Member State, the packaging shall be approved by the competent authority of the first COTIF Member State reached by the consignment.
NOTE: For the information in the transport document, see 5.4.1.2.1(e)

P 111	PACKING INSTRUCTION	P 111

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, waterproofed plastics textile, rubberized **Sheets** plastics textile, rubberized	Not necessary	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibreboard (1G) plastics, removable head (1H2)

Special packing provision

PP 43	For UN No. 0159, inner packagings are not required when metal (1A2 or 1B2) or plastics (1H2) drums are used as outer packagings.

P 112a	PACKING INSTRUCTION (Solid wetted, 1.1D)	P 112a

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions **of 4.1.5** are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, multiwall, water resistant plastics textile textile, rubberized woven plastics **Receptacles** metal plastics	**Bags** plastics textile, plastic coated or lined **Receptacles** metal plastics	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

Additional requirement

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

Special packing provisions

PP 26	For UN Nos. 0004, 0076, 0078, 0154, 0219 and 0394, packagings shall be lead free.
PP 45	For UN Nos. 0072 and 0226, intermediate packagings are not required.

P 112b	PACKING INSTRUCTION (Solid dry, other than powder 1.1D)	P 112b

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, kraft paper, multiwall, water resistant plastics textile textile, rubberized woven plastics	**Bags** (for UN No. 0150 only) plastics textile, plastic coated or lined	**Bags** woven plastics, sift-proof (5H2) woven plastics, water-resistant (5H3) plastics, film (5H4) textile, sift-proof (5L2) textile, water resistant (5L3) paper, multiwall, water resistant (5M2) **Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

Special packing provisions

PP 26	For UN Nos. 0004, 0076, 0078, 0154, 0216, 0219 and 0386, packagings shall be lead free.
PP 46	For UN Nos. 0209, bags, sift-proof (5H2) are recommended for flake or prilled TNT in the dry state and a maximum net mass of 30 kg.
PP 47	For UN No. 0222, inner packagings are not required when the outer packaging is a bag.

P 112c	PACKING INSTRUCTION (Solid dry powder 1.1D)	P 112c

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, multiwall, water resistant plastics woven plastics **Receptacles** fibreboard metal plastics wood	**Bags** paper, multiwall, water resistant with inner lining plastics **Receptacles** metal plastics	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibreboard (1G) plastics, removable head (1H2)

Additional requirements

1. Inner packagings are not required if drums are used as the outer packaging.
2. The packaging shall be sift-proof.

Special packing provisions

PP 26	For UN Nos. 0004, 0076, 0078, 0154, 0216, 0219 and 0386, packagings shall be lead free.
PP 46	For UN No. 0209, bags, sift-proof (5H2) are recommended for flake or prilled TNT in the dry state and a maximum net mass of 30 kg.
PP 48	For UN No. 0504, metal packagings shall not be used.

P 113	PACKING INSTRUCTION	P 113

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

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

Additional requirement

The packaging shall be sift-proof.

Special packing provisions

PP 49	For UN Nos. 0094 and 0305, no more than 50 g of substance shall be packed in an inner packaging.
PP 50	For UN No. 0027, inner packagings are not necessary when drums are used as outer packagings.
PP 51	For UN No. 0028, paper kraft or waxed paper sheets may be used as inner packagings.

P 114a	PACKING INSTRUCTION (Solid wetted)	P 114a

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics textile woven plastics **Receptacles** metal plastics	**Bags** plastics textile, plastic coated or lined **Receptacles** metal plastics	**Boxes** steel (4A) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

Additional requirement

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

Special packing provisions

PP 26	For UN Nos. 0077, 0132, 0234, 0235 and 0236, packagings shall be lead free.
PP 43	For UN No. 0342, inner packagings are not required when metal (1A2 or 1B2) or plastics (1H2) drums are used as outer packagings.

P 114b	PACKING INSTRUCTION (Solid dry)	P 114b

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

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

Special packing provisions

PP 26 **PP 48**	For UN Nos. 0077, 0132, 0234, 0235 and 0236, packagings shall be lead free. For UN No. 0508, metal packagings shall not be used.
PP 50	For UN Nos. 0160, 0161 and 0508, inner packagings are not necessary if drums are used as outer packagings.
PP 52	For UN Nos. 0160 and 0161, when metal drums (1A2 or 1B2) are used as outer packagings, metal packagings shall be so constructed that the risk of explosion, by reason of increased internal pressure from internal or external causes is prevented.

P 115	PACKING INSTRUCTION	P 115

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Receptacles plastics	**Bags** plastics in metal receptacles **Drums** metal	**Boxes** natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

Special packing provisions

PP 45	For UN No. 0144, intermediate packagings are not required.
PP 53	For UN Nos. 0075, 0143, 0495 and 0497, when boxes are used as outer packagings, inner packagings shall have taped screw cap closures and be not more than 5 litres capacity each. Inner packagings shall be surrounded with non-combustible absorbent cushioning materials. The amount of absorbent cushioning material shall be sufficient to absorb the liquid contents. Metal receptacles shall be cushioned from each other. Net mass of propellant is limited to 30 kg for each package when outer packagings are boxes.
PP 54	For UN Nos. 0075, 0143, 0495 and 0497, when drums are used as outer packagings and when intermediate packagings are drums, they shall be surrounded with non-combustible cushioning material in a quantity sufficient to absorb the liquid contents. A composite packaging consisting of a plastics receptacle in a metal drum may be used instead of the inner and intermediate packagings. The net volume of propellant in each package shall not exceed 120 litres.
PP 55	For UN No. 0144, absorbent cushioning material shall be inserted.
PP 56	For UN No. 0144, metal receptacles may be used as inner packagings.
PP 57	For UN Nos. 0075, 0143, 0495 and 0497, bags shall be used as intermediate packagings when boxes are used as outer packagings.
PP 58	For UN Nos. 0075, 0143, 0495 and 0497, drums shall be used as intermediate packagings when drums are used as outer packagings.
PP 59	For UN No. 0144, fibreboard boxes (4G) may be used as outer packagings.
PP 60	For UN No. 0144, aluminium drums, removable head (1B2) shall not be used.

P 116	PACKING INSTRUCTION	P 116

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper, water and oil resistant plastics textile, plastic coated or lined woven plastics, sift-proof **Receptacles** fibreboard, water resistant metal plastics wood, sift-proof **Sheets** paper, water resistant paper, waxed plastics	Not necessary	**Bags** woven plastics (5H1) paper, multiwall, water resistant (5M2) plastics, film (5H4) textile, sift-proof (5L2) textile, water resistant (5L3) **Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2) **Jerricans** steel, removable head (3A2) plastics, removable head (3H2)

Special packing provisions

PP 61	For UN Nos. 0082, 0241, 0331 and 0332, inner packagings are not required if leakproof removable head drums are used as outer packagings.
PP 62	For UN Nos. 0082, 0241, 0331 and 0332, inner packagings are not required when the explosive is contained in a material impervious to liquid.
PP 63	For UN No. 0081, inner packagings are not required when contained in rigid plastic which is impervious to nitric esters.
PP 64	For UN No. 0331, inner packagings are not required when bags (5H2), (5H3) or (5H4) are used as outer packagings.
PP 65	For UN Nos. 0082, 0241, 0331 and 0332, bags (5H2 or 5H3) may be used as outer packagings.
PP 66	For UN No. 0081, bags shall not be used as outer packagings.

P 130	PACKING INSTRUCTION	P 130
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings and arrangements	**Intermediate packagings and arrangements**	**Outer packagings and arrangements**
Not necessary	Not necessary	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)
Special packing provision		
PP 67	The following applies to UN Nos. 0006, 0009, 0010, 0015, 0016, 0018, 0019, 0034, 0035, 0038, 0039, 0048, 0056, 0137, 0138, 0168, 0169, 0171, 0181, 0182, 0183, 0186, 0221, 0243, 0244, 0245, 0246, 0254, 0280, 0281, 0286, 0287, 0297, 0299, 0300, 0301, 0303, 0321, 0328, 0329, 0344, 0345, 0346, 0347, 0362, 0363, 0370, 0412, 0424, 0425, 0434, 0435, 0436, 0437, 0438, 0451, 0488 and 0502: Large and robust explosives articles, normally intended for military use, without their means of initiation or with their means of initiation containing at least two effective protective features, may be carried unpackaged. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of carriage. A negative result in Test Series 4 on an unpackaged article indicates that the article can be considered for carriage unpackaged. Such unpackaged articles may be fixed to cradles or contained in crates or other suitable handling devices.	

P 131	PACKING INSTRUCTION	P 131
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings and arrangements	**Intermediate packagings and arrangements**	**Outer packagings and arrangements**
Bags paper plastics **Receptacles** fibreboard metal plastics wood **Reels**	Not necessary	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) **Fässer** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)
Special packing provision		
PP 68	For UN Nos. 0029, 0267 and 0455, bags and reels shall not be used as inner packagings.	

P 132a	PACKING INSTRUCTION (Articles consisting of closed metal, plastics or fibreboard casings that contain a detonating explosive, or consisting of plastics-bonded detonating explosives)	P 132a
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings and arrangements	**Intermediate packagings and arrangements**	**Outer packagings and arrangements**
Not necessary	Not necessary	**Boxes** steel (4A) aluminium (4B) wood, natural, ordinary (4C1) wood, natural, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)

P 132b	PACKING INSTRUCTION (Articles without closed casings)	P 132b

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Receptacles fibreboard metal plastics **Sheets** paper plastics	Not necessary	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)

P 133	PACKING INSTRUCTION	P 133

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Receptacles fibreboard metal plastics wood **Trays, fitted with dividing partitions** fibreboard plastics wood	**Receptacles** fibreboard metal plastics wood	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2)

Additional requirement

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

Special packing provision

PP 69	For UN Nos. 0043, 0212, 0225, 0268 and 0306, trays shall not be used as inner packagings.

P 134	PACKING INSTRUCTION	P 134

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags water resistant **Receptacles** fibreboard metal plastics wood **Sheets** fibreboard, corrugated **Tubes** fibreboard	Not necessary	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) **Fässer** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre(1G) plastics, removable head (1H2)

P 135	PACKING INSTRUCTION	P 135

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper plastics **Receptacles** fibreboard metal plastics wood **Sheets** paper plastics	Not necessary	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, expanded (4H1) plastics, solid (4H2) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

P 136	PACKING INSTRUCTION	P 136

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics textile **Boxes** fibreboard plastics wood **Dividing partitions in the outer packagings**	Not necessary	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

P 137	PACKING INSTRUCTION	P 137

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics **Boxes** fibreboard **Tubes** fibreboard metal plastics **Dividing partitions in the outer packagings**	Not necessary	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

Special packing provision

PP 70	For UN Nos. 0059, 0439, 0440 and 0441, when the shaped charges are packed singly, the conical cavity shall face downwards and the package marked "THIS SIDE UP". When the shaped charges are packed in pairs, the conical cavities shall face inwards to minimize the jetting effect in the event of accidental initiation.

P 138	PACKING INSTRUCTION	P 138

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags plastics	Not necessary	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

Additional requirement

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

P 139	PACKING INSTRUCTION	P 139

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

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

Special packing provisions

PP 71	For UN Nos. 0065, 0102, 0104, 0289 and 0290, the ends of the detonating cord shall be sealed, for example, by a plug firmly fixed so that the explosive cannot escape. The ends of flexible detonating cord shall be fastened securely.
PP 72	For UN Nos. 0065 and 0289, inner packagings are not required when they are in coils.

P 140	PACKING INSTRUCTION	P 140

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

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

Special packing provisions

PP 73	For UN No. 0105, no inner packagings are required if the ends are sealed.
PP 74	For UN No. 0101, the packaging shall be sift-proof except when the fuse is covered by a paper tube and both ends of the tube are covered with removable caps.
PP 75	For UN No. 0101, steel or aluminium boxes or drums shall not be used.

P 141	PACKING INSTRUCTION	P 141

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Receptacles fibreboard metal plastics wood **Trays, fitted with dividing partitions** plastics wood **Dividing partitions in the outer packagings**	Not necessary	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

P 142	PACKING INSTRUCTION	P 142

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

Inner packagings and arrangements	Intermediate packagings and arrangements	Outer packagings and arrangements
Bags paper plastics **Receptacles** fibreboard metal plastics wood **Sheets** paper **Trays, fitted with dividing partitions** plastics	Not necessary	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary (4C1) natural wood, sift-proof walls (4C2) plywood (4D) reconstituted wood (4F) fibreboard (4G) plastics, solid (4H2) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plywood (1D) fibre (1G) plastics, removable head (1H2)

P 143	PACKING INSTRUCTION	P 143

The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:

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

Additional requirement

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

Special packing provision

PP 76	For UN Nos. 0271, 0272, 0415 and 0491, when metal packagings are used, metal packagings shall be so constructed that the risk of explosion, by reason of increase in internal pressure from internal or external causes is prevented.

P 144	PACKING INSTRUCTION	P 144
The following packagings are authorized, provided the general packing provisions of 4.1.1, 4.1.3 and special packing provisions of 4.1.5 are met:		
Inner packagings and arrangements	**Intermediate packagings and arrangements**	**Outer packagings and arrangements**
Receptacles fibreboard metal plastics **Dividing partitions in the outer packagings**	Not necessary	**Boxes** steel (4A) aluminium (4B) natural wood, ordinary with metal liner plywood (4D) with metal liner reconstituted wood (4F) with metal liner plastics, expanded (4H1) plastics, solid (4H2) **Drums** steel, removable head (1A2) aluminium, removable head (1B2) plastics, removable head (1H2)
Special packing provision		
PP 77	For UN Nos. 0248 and 0249, packagings shall be protected against the ingress of water. When water-activated contrivances are transported unpackaged, they shall be provided with at least two independent protective features which prevent the ingress of water.	

Type of packagings

Cylinders, tubes, pressure drums and bundles of cylinders

Cylinders, tubes, pressure drums and bundles of cylinders are authorised provided the special packing provisions of 4.1.6 and the provisions listed below under (1) to (9) are met.

General

(1) Pressure receptacles shall be so closed and leakproof as to prevent escape of the gases;

(2) Pressure receptacles containing toxic substances with an LC_{50} less than or equal to 200 ml/m^3 (ppm) as specified in the table shall not be equipped with any pressure relief device. Pressure relief devices shall be fitted on UN pressure receptacles used for the carriage of UN No. 1013 carbon dioxide and UN No. 1070 nitrous oxide.

(3) The following three tables cover compressed gases (Table 1), liquefied and dissolved gases (Table 2) and substances not in Class 2 (Table 3). They provide:

(a) the UN number, name and description, and the classification code of the substance;

(b) the LC_{50} for toxic substances;

(c) the types of pressure receptacles authorised for the substance, shown by the letter "X";

(d) the maximum test period for periodic inspection of the pressure receptacles;

NOTE: For pressure receptacles which make use of composite materials, the periodic inspection frequencies shall be as determined by the competent authority which approved the receptacles.

(e) the minimum test pressure of the pressure receptacles;

(f) the maximum working pressure of the pressure receptacles for compressed gases or the maximum filling ratio(s) for liquefied and dissolved gases;

(g) special packing provisions that are specific to a substance.

Test pressure, filling ratios and filling requirements

(4) The minimum test pressure required for is 1 MPa (10 bar);

(5) In no case shall pressure receptacles be filled in excess of the limit permitted in the following requirements:

(a) For compressed gases, the working pressure shall be not more than two thirds of the test pressure of the pressure receptacles. Restrictions to this upper limit on working pressure are imposed by special packing provision "o". In no case shall the internal pressure at 65 °C exceed the test pressure.

(b) For high pressure liquefied gases, the filling ratio shall be such that the settled pressure at 65 °C does not exceed the test pressure of the pressure receptacles.

The use of test pressures and filling ratios other than those in the Table is permitted, except where special packing provision "o" applies, provided that:

(i) the criterion of special packing provision "r" is met when applicable; or

(ii) the above criterion is met in all other cases.

For high pressure liquefied gases and gas mixtures for which relevant data are not available, the maximum filling ratio (FR) shall be determined as follows:

$$FR = 8{,}5 \times 10^{-4} \times d_g \times P_h$$

where

FR = maximum filling ratio

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

P_h = minimum test pressure (in bar).

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

$$FR = \frac{P_h \times MM \times 10^{-3}}{R \times 338}$$

where

FR = maximum filling ratio

P_h = minimum test pressure (in bar)

MM = molecular mass (in g/mol)

R = 8.31451 x 10^{-2} bar.l.mol^{-1}.K^{-1} (gas constant).

For gas mixtures, the average molecular mass is to be taken, taking into account the volumetric concentra-

tions of the various components.

(c) For low pressure liquefied gases, the maximum mass of contents per litre of water capacity shall equal 0.95 times the density of the liquid phase at 50 °C; in addition, the liquid phase shall not fill the pressure receptacle at any temperature up to 60 °C. The test pressure of the pressure receptacle shall be at least equal to the vapour pressure (absolute) of the liquid at 65 °C, minus 100 kPa (1 bar).

For low pressure liquefied gases and gas mixtures for which relevant data are not available, the maximum filling ratio shall be determined as follows:

$$FR = (0{,}0032 \times BP - 0{,}24) \times d_l$$

where

FR = maximum filling ratio

BP = boiling point (in Kelvin)

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

(d) For UN No. 1001 acetylene, dissolved, and UN No. 3374 acetylene, solvent free, see (10), special packing provision "p".

(6) Other test pressure and filling ratio may be used provided they satisfy the general requirements outlined in paragraphs (4) and (5) above;

(7) The filling of pressure receptacles may only be carried out by specially-equipped centres, with qualified staff using appropriate procedures.

The procedures shall include checks:

– of the conformity to regulations of receptacles and accessories;
– of their compatibility with the product to be carried;
– of the absence of damage which might affect safety;
– of compliance with the degree or pressure of filling, as appropriate;
– of regulation markings and identification.

Periodic inspections

(8) Refillable pressure receptacles shall be subjected to periodic inspections in accordance with the requirements of 6.2.1.6 and 6.2.3.5 respectively.

(9) If special provisions for certain substances do not appear in the tables below, periodic inspections shall be carried out:

(a) Every 5 years in the case of pressure receptacles intended for the carriage of gases of classification codes 1T, 1TF, 1TO, 1TC, 1TFC, 1TOC, 2T, 2TO, 2TF, 2TC, 2TFC, 2TOC, 4A, 4F and 4TC;

(b) Every 5 years in the case of pressure receptacles intended for the carriage of substances from other classes;

(c) Every 10 years in the case of pressure receptacles intended for the carriage of gases of classification codes 1A, 1O, 1F, 2A, 2O and 2F.

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

Special packing provisions

(10) Keys for the column "Special packing provisions":

Material compatibility (for gases see ISO 11114-1:1997 and ISO 11114-2:2000)

a: Aluminium alloy pressure receptacles are not authorized.

b: Copper valves shall not be used.

c: Metal parts in contact with the contents shall not contain more than 65% copper.

d: When steel pressure receptacles are used, only those resistant to hydrogen embrittlement shall be authorized.

Requirements for toxic substances with an LC_{50} less than or equal to 200 ml/m^3 (ppm)

k: Valve outlets shall be fitted with gas tight plugs or caps which shall be made of material not liable to attack by the contents of the pressure receptacle.

Each cylinder within a bundle shall be fitted with an individual valve that shall be closed during carriage. After filling, the manifold shall be evacuated, purged and plugged.

Bundles containing UN 1045 Fluorine, compressed, may be constructed with isolation valves on groups of cylinders not exceeding 150 litres total water capacity instead of isolation valves on every cylinder.

Cylinders and individual cylinders within a bundle shall have a test pressure greater than or equal to 200 bar and a minimum wall thickness of 3.5 mm for aluminium alloy or 2 mm for steel. Individual cylinders not complying with this requirement shall be carried in a rigid outer packaging that will adequately protect the cylinder and its fittings and meeting the packing group I performance level. Pressure drums shall have a minimum wall thickness as specified by the competent authority.

Pressure receptacles shall not be fitted with a pressure relief device.

Cylinders and individual cylinders in a bundle shall be limited to a maximum water capacity of 85 litres.

Each valve shall have a taper threaded connection directly to the pressure receptacle and be capable of withstanding the test pressure of the pressure receptacle.

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

Carriage in capsules is not allowed.

Each pressure receptacle shall be tested for leakage after filling.

Gas specific provisions

l: UN No. 1040 ethylene oxide may also be packed in hermetically sealed glass or metal inner packagings suitably cushioned in fibreboard, wooden or metal boxes meeting the packing group I performance level. The maximum quantity permitted in any glass inner packaging is 30 g, and the maximum quantity permitted in any metal inner packaging is 200 g. After filling, each inner packaging shall be determined to be leak-tight by placing the inner packaging in a hot water bath at a temperature, and for a period of time, sufficient to ensure that an internal pressure equal to the vapour pressure of ethylene oxide at 55 °C is achieved. The maximum net mass in any outer packaging shall not exceed 2.5 kg.

m: Pressure receptacles shall be filled to a working pressure not exceeding 5 bar.

n: Cylinders and individual cylinders in a bundle shall contain not more than 5 kg of the gas. When bundles containing UN 1045 Fluorine, compressed are divided into groups of cylinders in accordance with special packing provision "k" each group shall contain not more than 5 kg of the gas.

o: In no case shall the working pressure or filling ratio shown in the tables be exceeded.

p: For UN No. 1001 acetylene, dissolved, and UN No. 3374 acetylene, solvent free: cylinders shall be filled with a homogeneous monolithic porous material; the working pressure and the quantity of acetylene shall not exceed the values prescribed in the approval or in ISO 3807-1:2000 or ISO 3807-2:2000, as applicable.

For UN No. 1001 acetylene, dissolved: cylinders shall contain a quantity of acetone or suitable solvent as specified in the approval (see ISO 3807-1:2000 or ISO 3807-2:2000, as applicable); cylinders fitted with pressure relief devices or manifolded together shall be carried vertically.

Alternatively, for UN No. 1001 acetylene, dissolved: cylinders which are not UN pressure receptacles may be filled with a non monolithic porous material; the working pressure, the quantity of acetylene and the quantity of solvent shall not exceed the values prescribed in the approval. The maximum test period for periodic inspection of the cylinders shall not exceed five years.

A test pressure of 52 bar shall be applied only to cylinders conforming to ISO 3807-2:2000.

q: The valves of pressure receptacles for pyrophoric gases or flammable mixtures of gases containing more than 1% of pyrophoric compounds shall be fitted with gas-tight plugs or caps which shall be made of material not liable to attack by the contents of the pressure receptacle. When these pressure receptacles are manifolded in a bundle, each of the pressure receptacles shall be fitted with an individual valve that shall be closed during carriage, and the manifold outlet valve shall be fitted with a gas-tight plug or cap. Carriage in capsules is not allowed.

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

ra: Allowed for carriage in capsules under the following conditions:

(a) The mass of gas shall not exceed 150 g per capsule;

(b) The capsules shall be free from faults liable to impair the strength;

(c) The leakproofness of the closure shall be ensured by an additional device (cap, crown, seal, binding, etc.) capable of preventing any leakage of the closure during carriage;

(d) The capsules shall be placed in an outer packaging of sufficient strength. A package shall not weigh more than 75 kg.

s: Aluminium alloy pressure receptacles shall be:
- Equipped only with brass or stainless steel valves; and
- Cleaned for hydrocarbons contamination and not contaminated with oil. UN pressure receptacles shall be cleaned in accordance with ISO 11621:1997.

ta: (Reserved)

Periodic inspection

u: The interval between periodic tests may be extended to 10 years for aluminium alloy pressure receptacles. This derogation may only be applied to UN pressure receptacles when the alloy of the pressure receptacle has been subjected to stress corrosion testing as specified in ISO 7866:1999.

v: The interval between inspections for steel cylinders may be extended to 15 years:
(a) with the agreement of the competent authority (authorities) of the country (countries) where the periodic inspection and the carriage take place; and
(b) in accordance with the requirements of a technical code or a standard recognised by the competent authority, or standard EN 1440:1996 "Transportable refillable welded cylinders for liquefied petroleum gas (LPG) – Periodic requalification".

Requirements for N.O.S. entries and for mixtures

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

The test pressure and filling ratio shall be calculated in accordance with the relevant requirements of (5).

Toxic substances with an LC_{50} less than or equal to 200 ml/m^3 shall not be carried in tubes, pressure drums or MEGCs and shall meet the requirements of special packing provision "k". However, UN 1975 Nitric oxide and dinitrogen tetroxide mixture may be carried in pressure drums.

For pressure receptacles containing pyrophoric gases or flammable mixtures of gases containing more than 1% pyrophoric compounds, the requirements of special packing provision "q" shall be met.

The necessary steps shall be taken to prevent dangerous reactions (i.e. polymerisation or decomposition) during carriage. If necessary, stabilisation or addition of an inhibitor shall be required.

Mixtures containing UN No. 1911 diborane, shall be filled to a pressure such that, if complete decomposition of the diborane occurs, two thirds of the test pressure of the pressure receptacle shall not be exceeded.

Mixtures containing UN 2192 germane, other than mixtures of up to 35% germane in hydrogen or nitrogen or up to 28% germane in helium or argon, shall be filled to a pressure such that, if complete decomposition of the germane occurs, two thirds of the test pressure of the pressure receptacle shall not be exceeded.

Requirements for substances not in Class 2

ab: Pressure receptacles shall satisfy the following conditions:
(i) The pressure test shall include an inspection of the inside of the pressure receptacles and check of accessories;

(ii) In addition resistance to corrosion shall be checked every two years by means of suitable instruments (e.g. ultrasound) and the condition of the accessories verified;

(iii) Wall thickness shall not be less than 3 mm.

ac: Tests and inspections shall be carried out under the supervision of an expert approved by the competent authority.

ad: Pressure receptacles shall satisfy the following conditions:
(i) Pressure receptacles shall be designed for a design pressure of not less than 2.1 MPa (21 bar) (gauge pressure);
(ii) In addition to the marks for refillable receptacles, the pressure receptacles shall bear the following particulars in clearly legible and durable characters:
- The UN number and the proper shipping name of the substance according to 3.1.2;
- The maximum permitted mass when filled and the tare of the pressure receptacle, including accessories fitted during filling, or the gross mass.

(11) The applicable requirements of this packing instruction are considered to have been complied with if the following standards, as relevant, are applied:

Applicable requirements	Reference	Title of document
(7)	EN 1919:2000	Transportable gas cylinders – Cylinders for gases (excluding acetylene and LPG) – Inspection at time of filling
(7)	EN 1920:2000	Transportable gas cylinders – Cylinders for compressed gases (excluding acetylene) – Inspection at time of filling
(7)	EN 12754:2001	Transportable gas cylinders – Cylinders for dissolved acetylene – Inspection at time of filling
(7)	EN 13365:2002 + A1:2005	Transportable gas cylinders – Cylinder bundles for permanent and liquefied gases (excluding acetylene) – Inspection at the time of filling
(7)	EN 1439:2008 (except 3.5 and Annex G)	LPG equipment and accessories – Procedures for checking LPG cylinders before, during and after filling
(7)	EN 14794:2005	LPG equipment and accessories – Transportable refillable aluminium cylinders for liquefied petroleum gas (LPG) – Procedure for checking before, during and after filling
(10) p	EN 1801:1998	Transportable gas cylinders – Filling conditions for single acetylene cylinders (including list of permissible porous materials)
(10) p	EN 12755:2000	Transportable gas cylinders – Filling conditions for acetylene bundles

Table 1: Compressed gases

UN No.	Name and description	Classification code	LC_{50} ml/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years[a]	Test pressure, bar[b]	Maximum working pressure, bar[b]	Special packing provisions
1002	AIR, COMPRESSED	1 A		X	X	X	X	10			
1006	ARGON, COMPRESSED	1 A		X	X	X	X	10			
1016	CARBON MONOXIDE, COMPRESSED	1 TF	3760	X	X	X	X	5			u
1023	COAL GAS, COMPRESSED	1 TF		X	X	X	X	5			
1045	FLUORINE, COMPRESSED	1 TOC	185	X			X	5	200	30	a, k, n, o
1046	HELIUM, COMPRESSED	1 A		X	X	X	X	10			
1049	HYDROGEN, COMPRESSED	1 F		X	X	X	X	10			d
1056	KRYPTON, COMPRESSED	1 A		X	X	X	X	10			
1065	NEON, COMPRESSED	1 A		X	X	X	X	10			
1066	NITROGEN, COMPRESSED	1 A		X	X	X	X	10			
1071	OIL GAS, COMPRESSED	1 TF		X	X	X	X	5			
1072	OXYGEN, COMPRESSED	1 O		X	X	X	X	10			s
1612	HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE	1 T		X	X	X	X	5			z
1660	NITRIC OXIDE, COMPRESSED	1 TOC	115	X			X	5	225	33	k, o
1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.	1 TF	≤ 5000	X	X	X	X	5			z
1954	COMPRESSED GAS, FLAMMABLE, N.O.S	1 F		X	X	X	X	10			z
1955	COMPRESSED GAS, TOXIC, N.O.S.	1 T	≤ 5000	X	X	X	X	5			z
1956	COMPRESSED GAS, N.O.S.	1 A		X	X	X	X	10			z
1957	DEUTERIUM, COMPRESSED	1 F		X	X	X	X	10			d
1964	HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S.	1 F		X	X	X	X	10			z
1971 1971	METHANE, COMPRESSED or NATURAL GAS, COMPRESSED with high methane content	1 F		X	X	X	X	10			

UN No.	Name and description	Classification code	LC_{50} ml/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years[a]	Test pressure, bar[b]	Maximum working pressure, bar[b]	Special packing provisions
2034	HYDROGEN AND METHANE MIXTURE, COMPRESSED	1 F		X	X	X	X	10			d
2190	OXYGEN DIFLUORIDE, COMPRESSED	1 TOC	2,6	X			X	5	200	30	a, k, n, o
3156	COMPRESSED GAS, OXIDIZING, N.O.S.	1 O		X	X	X	X	10			z
3303	COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S.	1 TO	≤ 5000	X	X	X	X	5			z
3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.	1 TC	≤ 5000	X	X	X	X	5			z
3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	1 TFC	≤ 5000	X	X	X	X	5			z
3306	COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	1 TOC	≤ 5000	X	X	X	X	5			z

[a] Not applicable for pressure receptacles made of composite materials.

[b] Where the entries are blank, the working pressure shall not exceed two thirds of the test pressure.

Table 2: Liquefied gases and dissolved gases

UN No.	Name and description	Classification code	LC_{50} ml/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years[a]	Test pressure, bar	Filling ratio	Special packing provisions
1001	ACETYLENE, DISSOLVED	4 F		X			X	10	60		c, p
1005	AMMONIA, ANHYDROUS	2 TC	4000	X	X	X	X	5	29	0.54	b, ra
1008	BORON TRIFLUORIDE	2 TC	387	X	X	X	X	5	225 300	0.715 0.86	
1009	BROMOTRIFLUOROMETHANE (REFRIGERANT GAS R 13B1)	2 A		X	X	X	X	10	42 120 250	1.13 1.44 1.60	ra ra ra
1010	BUTADIENES, STABILIZED (1,2-butadiene) or	2 F		X	X	X	X	10	10	0.59	ra
1010	BUTADIENES, STABILIZED (1,3-butadiene) or	2 F		X	X	X	X	10	10	0.55	ra
1010	BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED	2 F		X	X	X	X	10	10	0.50	ra, v, z
1011	BUTANE	2 F		X	X	X	X	10	10	0.52	ra, v
1012	BUTYLENES MIXTURES or	2 F		X	X	X	X	10	10	0.50	ra, z
1012	1-BUTYLENE or	2 F		X	X	X	X	10	10	0.53	
1012	CIS-2-BUTYLENE or	2 F		X	X	X	X	10	10	0.55	
1012	TRANS-2 BUTYLENE	2 F		X	X	X	X	10	10	0.54	
1013	CARBON DIOXIDE	2 A		X	X	X	X	10	190 250	0.68 0.76	ra ra
1017	CHLORINE	2 TOC	293	X	X	X	X	5	22	1.25	a, ra
1018	CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)	2 A		X	X	X	X	10	27	1.03	ra
1020	CHLOROPENTAFLUOROETHANE (REFRIGERANT GAS R 115)	2 A		X	X	X	X	10	25	1.05	ra
1021	1-CHLORO-1,2,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 124)	2 A		X	X	X	X	10	11	1.20	
1022	CHLOROTRIFLUOROMETHANE (REFRIGERANT GAS R 13)	2 A		X	X	X	X	10	100 120 190 250	0.83 0.90 1.04 1.11	ra ra ra ra
1026	CYANOGEN	2 TF	350	X	X	X	X	5	100	0.70	ra, u
1027	CYCLOPROPANE	2 F		X	X	X	X	10	18	0.55	ra
1028	DICHLORODIFLUOROMETHANE (REFRIGERANT GAS R 12)	2 A		X	X	X	X	10	16	1.15	ra
1029	DICHLOROFLUOROMETHANE (REFRIGERANT GAS R 21)	2 A		X	X	X	X	10	10	1.23	ra

UN No.	Name and description	Classification code	LC_{50} ml/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years[a]	Test pressure, bar	Filling ratio	Special packing provisions
1030	1,1-DIFLUOROETHANE (REFRIGERANT GAS R 152a)	2 F		X	X	X	X	10	16	0.79	ra
1032	DIMETHYLAMINE, ANHYDROUS	2 F		X	X	X	X	10	10	0.59	b, ra
1033	DIMETHYL ETHER	2 F		X	X	X	X	10	18	0.58	ra
1035	ETHANE	2 F		X	X	X	X	10	95 120 300	0.25 0.30 0.40	ra ra ra
1036	ETHYLAMINE	2 F		X	X	X	X	10	10	0.61	b, ra
1037	ETHYL CHLORIDE	2 F		X	X	X	X	10	10	0.80	a, ra
1039	ETHYL METHYL ETHER	2 F		X	X	X	X	10	10	0.64	ra
1040 1040	ETHYLENE OXIDE, or ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1MPa (10 bar) at 50 °C	2 TF	2900	X	X	X	X	5	15	0.78	l, ra
1041	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 9% but not more than 87% ethylene oxide	2 F		X	X	X	X	10	190 250	0.66 0.75	ra ra
1043	FERTILIZER AMMONIATING SOLUTION with free ammonia	CARRIAGE PROHIBITED									
1048	HYDROGEN BROMIDE, ANHYDROUS	2 TC	2860	X	X	X	X	5	60	1.51	a, d, ra
1050	HYDROGEN CHLORIDE, ANHYDROUS	2 TC	2810	X	X	X	X	5	100 120 150 200	0.30 0.56 0.67 0.74	a, d, ra a, d, ra a, d, ra a, d, ra
1053	HYDROGEN SULPHIDE	2 TF	712	X	X	X	X	5	48	0.67	d, ra, u
1055	ISOBUTYLENE	2 F		X	X	X	X	10	10	0.52	ra
1058	LIQUEFIED GASES, non-flammable, charged with nitrogen, carbon dioxide or air	2 A		X	X	X	X	10	Test pressure = 1.5 x working pressure		ra
1060	METHYLACETYLENE AND PROPADIENE MIXTURE, STABILIZED Propadiene with 1% to 4% methylacetylene Mixture P1 Mixture P2	2 F		X X X X	X X X X	X X X X	X X X X	10 10 10 10	 22 30 24	 0.52 0.49 0.47	c, ra, z c, ra c, ra c, ra
1061	METHYLAMINE, ANHYDROUS	2 F		X	X	X	X	10	13	0.58	b, ra
1062	METHYL BROMIDE with not more than 2% chloropicrin	2 T	850	X	X	X	X	5	10	1.51	a
1063	METHYL CHLORIDE (REFRIGERANT GAS R 40)	2 F		X	X	X	X	10	17	0.81	a, ra
1064	METHYL MERCAPTAN	2 TF	1350	X	X	X	X	5	10	0.78	d, ra, u
1067	DINITROGEN TETROXIDE (NITROGEN DIOXIDE)	2 TOC	115	X		X	X	5	10	1.30	k
1069	NITROSYL CHLORIDE	2 TC	35	X			X	5	13	1.10	k, ra
1070	NITROUS OXIDE	2 O		X	X	X	X	10	180 225 250	0.68 0.74 0.75	
1075	PETROLEUM GASES, LIQUEFIED	2 F		X	X	X	X	10			v, z
1076	PHOSGENE	2 TC	5	X		X	X	5	20	1.23	k, ra
1077	PROPYLENE	2 F		X	X	X	X	10	27	0.43	ra
1078	REFRIGERANT GAS, N.O.S. Mixture F 1 Mixture F 2 Mixture F 3	2 A		X X X X	X X X X	X X X X	X X X X	10 10 10 10	 12 18 29	 1.23 1.15 1.03	ra, z
1079	SULPHUR DIOXIDE	2 TC	2520	X	X	X	X	5	12	1.23	ra
1080	SULPHUR HEXAFLUORIDE	2 A		X	X	X	X	10	70 140 160	1.06 1.34 1.38	ra ra ra
1081	TETRAFLUOROETHYLENE, STABILIZED	2 F		X	X	X	X	10	200		m, o, ra
1082	TRIFLUOROCHLOROETHYLENE, STABILIZED	2 TF	2000	X	X	X	X	5	19	1.13	ra, u
1083	TRIMETHYLAMINE, ANHYDROUS	2 F		X	X	X	X	10	10	0.56	b, ra
1085	VINYL BROMIDE, STABILIZED	2 F		X	X	X	X	10	10	1.37	a, ra

UN No.	Name and description	Classification code	LC_{50} ml/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years[a]	Test pressure, bar	Filling ratio	Special packing provisions
1086	VINYL CHLORIDE, STABILIZED	2 F		X	X	X	X	10	12	0.81	a, ra
1087	VINYL METHYL ETHER, STABILIZED	2 F		X	X	X	X	10	10	0.67	ra
1581	CHLOROPICRIN AND METHYL BROMIDE MIXTURE with more than 2% chloropicrin	2 T	850	X	X	X	X	5	10	1.51	a
1582	CHLOROPICRIN AND METHYL CHLORIDE MIXTURE	2 T	[d]	X	X	X	X	5	17	0.81	a
1589	CYANOGEN CHLORIDE, STABILIZED	2 TC	80	X			X	5	20	1.03	k
1741	BORON TRICHLORIDE	2 TC	2541	X	X	X	X	5	10	1.19	ra
1749	CHLORINE TRIFLUORIDE	2 TOC	299	X	X	X	X	5	30	1.40	a
1858	HEXAFLUOROPROPYLENE (REFRIGERANT GAS R 1216)	2 A		X	X	X	X	10	22	1.11	ra
1859	SILICON TETRAFLUORIDE	2 TC	450	X	X	X	X	5	200 300	0.74 1.10	
1860	VINYL FLUORIDE, STABILIZED	2 F		X	X	X	X	10	250	0.64	a, ra
1911	DIBORANE	2 TF	80	X			X	5	250	0.07	d, k, o
1912	METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	2 F		X	X	X	X	10	17	0.81	a, ra
1952	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with not more than 9% ethylene oxide	2 A		X	X	X	X	10	190 250	0.66 0.75	ra ra
1958	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 114)	2 A		X	X	X	X	10	10	1.30	ra
1959	1,1-DIFLUOROETHYLENE (REFRIGERANT GAS R 1132a)	2 F		X	X	X	X	10	250	0.77	ra
1962	ETHYLENE	2 F		X	X	X	X	10	225 300	0.34 0.38	
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED,N.O.S Mixture A Mixture A 01 Mixture A 02 Mixture A 0 Mixture A 1 Mixture B 1 Mixture B 2 Mixture B Mixture C	2 F		X	X	X	X	10 10 10 10 10 10 10 10 10 10	 10 15 15 15 20 25 25 25 30	[b] 0.50 0.49 0.48 0.47 0.46 0.45 0.44 0.43 0.42	ra, v, z
1967	INSECTICIDE GAS, TOXIC, N.O.S.	2 T		X	X	X	X	5			z
1968	INSECTICIDE GAS, N.O.S.	2 A		X	X	X	X	10			ra, z
1969	ISOBUTANE	2 F		X	X	X	X	10	10	0.49	ra, v
1973	CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE with fixed boiling point, with approximately 49% chlorodifluoromethane (REFRIGERANT GAS R 502)	2 A		X	X	X	X	10	31	1.01	ra
1974	CHLORODIFLUOROBROMOMETHANE (REFRIGERANT GAS R 12B1)	2 A		X	X	X	X	10	10	1.61	ra
1975	NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURE (NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURE)	2 TOC	115	X		X	X	5			k, z
1976	OCTAFLUOROCYCLOBUTANE (REFRIGERANT GAS RC 318)	2 A		X	X	X	X	10	11	1.32	ra
1978	PROPANE	2 F		X	X	X	X	10	23	0.43	ra, v
1982	TETRAFLUOROMETHANE (REFRIGERANT GAS R 14)	2 A		X	X	X	X	10	200 300	0.71 0.90	
1983	1-CHLORO-2,2,2-TRIFLUOROETHANE (REFRIGERANT GAS R 133a)	2 A		X	X	X	X	10	10	1.18	ra
1984	TRIFLUOROMETHANE (REFRIGERANT GAS R 23)	2 A		X	X	X	X	10	190 250	0.88 0.96	ra ra
2035	1,1,1-TRIFLUOROETHANE (REFRIGERANT GAS R 143a)	2 F		X	X	X	X	10	35	0.73	ra

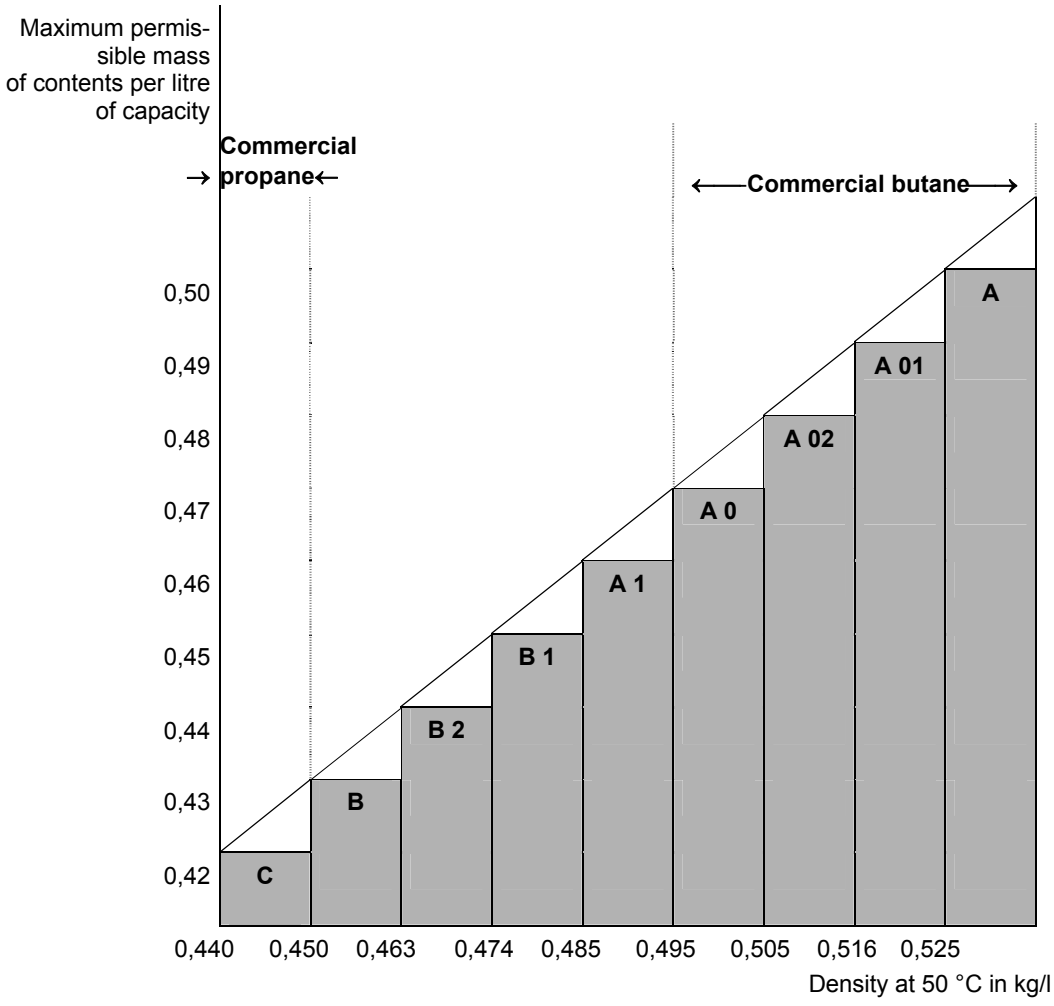
UN No.	Name and description	Classification code	LC_{50} ml/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years[a]	Test pressure, bar	Filling ratio	Special packing provisions
2036	XENON	2 A		X	X	X	X	10	130	1.28	
2044	2,2-DIMETHYLPROPANE	2 F		X	X	X	X	10	10	0.53	ra
2073	AMMONIA SOLUTION, relative density less than 0.880 at 15 °C in water, with more than 35% but not more than 40% ammonia with more than 40% but not more than 50% ammonia	4 A		 X X	 X X	 X X	 X X	 5 5	 10 12	 0.80 0.77	 b b
2188	ARSINE	2 TF	20	X			X	5	42	1.10	d, k
2189	DICHLOROSILANE	2 TFC	314	X	X	X	X	5	10 200	0.90 1.08	
2191	SULPHURYL FLUORIDE	2 T	3020	X	X	X	X	5	50	1.10	u
2192	GERMANE[c]	2 TF	620	X	X	X	X	5	250	0.064	d, q, r, ra
2193	HEXAFLUOROETHANE (REFRIGERANT GAS R 116)	2 A		X	X	X	X	10	200	1.13	
2194	SELENIUM HEXAFLUORIDE	2 TC	50	X			X	5	36	1.46	k, ra
2195	TELLURIUM HEXAFLUORIDE	2 TC	25	X			X	5	20	1.00	k, ra
2196	TUNGSTEN HEXAFLUORIDE	2 TC	160	X			X	5	10	3.08	a, k, ra
2197	HYDROGEN IODIDE, ANHYDROUS	2 TC	2860	X	X	X	X	5	23	2.25	a, d, ra
2198	PHOSPHORUS PENTAFLUORIDE	2 TC	190	X			X	5	200 300	0.90 1.25	k k
2199	PHOSPHINE[c]	2 TF	20	X			X	5	225 250	0.30 0.45	d, k, q d, k, q
2200	PROPADIENE, STABILIZED	2 F		X	X	X	X	10	22	0.50	ra
2202	HYDROGEN SELENIDE, ANHYDROUS	2 TF	2	X			X	5	31	1.60	k
2203	SILANE[c]	2 F		X	X	X	X	10	225 250	0.32 0.36	q q
2204	CARBONYL SULPHIDE	2 TF	1700	X	X	X	X	5	30	0.87	ra, u
2417	CARBONYL FLUORIDE	2 TC	360	X	X	X	X	5	200 300	0.47 0.70	
2418	SULPHUR TETRAFLUORIDE	2 TC	40	X			X	5	30	0.91	k, ra
2419	BROMOTRIFLUORO-ETHYLENE	2 F		X	X	X	X	10	10	1.19	ra
2420	HEXAFLUOROACETONE	2 TC	470	X	X	X	X	5	22	1.08	ra
2421	NITROGEN TRIOXIDE	2 TOC	CARRIAGE PROHIBITED								
2422	OCTAFLUOROBUT-2-ENE (REFRIGERANT GAS R 1318)	2 A		X	X	X	X	10	12	1.34	ra
2424	OCTAFLUOROPROPANE (REFRIGERANT GAS R 218)	2 A		X	X	X	X	10	25	1.04	ra
2451	NITROGEN TRIFLUORIDE	2 O		X	X	X	X	10	200	0.50	
2452	ETHYLACETYLENE, STABILIZED	2 F		X	X	X	X	10	10	0.57	c, ra
2453	ETHYL FLUORIDE (REFRIGERANT GAS R 161)	2 F		X	X	X	X	10	30	0.57	ra
2454	METHYL FLUORIDE (REFRIGERANT GAS R 41)	2 F		X	X	X	X	10	300	0.63	ra
2455	METHYL NITRITE	2 A	CARRIAGE PROHIBITED								
2517	1-CHLORO-1,1-DIFLUOROETHANE (REFRIGERANT GAS R 142b)	2 F		X	X	X	X	10	10	0.99	ra
2534	METHYLCHLOROSILANE	2 TFC	600	X	X	X	X	5			ra, z
2548	CHLORINE PENTAFLUORIDE	2 TOC	122	X			X	5	13	1.49	a, k
2599	CHLOROTRIFLUORO-METHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE with approximately 60% chlorotrifluoromethane (REFRIGERANT GAS R 503)	2 A		X	X	X	X	10	31 42 100	0.12 0.17 0.64	ra ra ra
2601	CYCLOBUTANE	2 F		X	X	X	X	10	10	0.63	ra
2602	DICHLORODIFLUORO-METHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE with approximately 74% dichlorodifluoromethane (REFRIGERANT GAS R 500)	2 A		X	X	X	X	10	22	1.01	ra
2676	STIBINE	2 TF	20	X			X	5	200	0.49	k, r, ra
2901	BROMINE CHLORIDE	2 TOC	290	X	X	X	X	5	10	1.50	a

UN No.	Name and description	Classification code	LC_{50} ml/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years[a]	Test pressure, bar	Filling ratio	Special packing provisions
3057	TRIFLUOROACETYL CHLORIDE	2 TC	10	X		X	X	5	17	1.17	k, ra
3070	ETHYLENE OXIDE AND DICHLORODIFLUOROMETHANE MIXTURE with not more than 12,5% ethylene oxide	2 A		X	X	X	X	10	18	1.09	ra
3083	PERCHLORYL FLUORIDE	2 TO	770	X	X	X	X	5	33	1.21	u
3153	PERFLUORO(METHYL VINYL ETHER)	2 F		X	X	X	X	10	20	0.75	ra
3154	PERFLUORO(ETHYL VINYL ETHER)	2 F		X	X	X	X	10	10	0.98	ra
3157	LIQUEFIED GAS, OXIDIZING, N.O.S.	2 O		X	X	X	X	10			z
3159	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)	2 A		X	X	X	X	10	18	1.05	ra
3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.	2 TF	≤ 5000	X	X	X	X	5			ra, z
3161	LIQUEFIED GAS, FLAMMABLE, N.O.S.	2 F		X	X	X	X	10			ra, z
3162	LIQUEFIED GAS, TOXIC, N.O.S.	2 T	≤ 5000	X	X	X	X	5			z
3163	LIQUEFIED GAS, N.O.S.	2 A		X	X	X	X	10			ra, z
3220	PENTAFLUOROETHANE (REFRIGERANT GAS R 125)	2 A		X	X	X	X	10	49 35	0.95 0.87	ra ra
3252	DIFLUOROMETHANE (REFRIGERANT GAS R 32)	2 F		X	X	X	X	10	48	0.78	ra
3296	HEPTAFLUOROPROPANE (REFRIGERANT GAS R 227)	2 A		X	X	X	X	10	13	1.21	ra
3297	ETHYLENE OXIDE AND CHLOROTETRAFLUOROETHANE MIXTURE with not more than 8.8% ethylene oxide	2 A		X	X	X	X	10	10	1.16	ra
3298	ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE with not more than 7.9% ethylene oxide	2 A		X	X	X	X	10	26	1.02	ra
3299	ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE with not more than 5.6% ethylene oxide	2 A		X	X	X	X	10	17	1.03	ra
3300	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 87% ethylene oxide	2 TF	> 2900	X	X	X	X	5	28	0.73	ra
3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.	2 TO	≤ 5000	X	X	X	X	5			z
3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.	2 TC	≤ 5000	X	X	X	X	5			ra, z
3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	2 TFC	≤ 5000	X	X	X	X	5			ra, z
3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	2 TOC	≤ 5000	X	X	X	X	5			z
3318	AMMONIA SOLUTION, relative density less than 0.880 at 15 °C in water, with more than 50% ammonia	4 TC		X	X	X	X	5			b
3337	REFRIGERANT GAS R 404A (Pentafluoroethane, 1,1,1-trifluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 44% pentafluoroethane and 52% 1,1,1-trifluoroethane)	2 A		X	X	X	X	10	36	0.82	ra
3338	REFRIGERANT GAS R 407A (Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 20% difluoromethane and 40% pentafluoroethane)	2 A		X	X	X	X	10	32	0.94	ra
3339	REFRIGERANT GAS R 407B (Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 10% difluoromethane and 70% pentafluoroethane	2 A		X	X	X	X	10	33	0.93	ra

UN No.	Name and description	Classification code	LC_{50} ml/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years[a]	Test pressure, bar	Filling ratio	Special packing provisions
3340	REFRIGERANT GAS R 407C (Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane zeotropic mixture with approximately 23% difluoromethane and 25% pentafluoroethane)	2 A		X	X	X	X	10	30	0.95	ra
3354	INSECTICIDE GAS, FLAMMABLE, N.O.S	2 F		X	X	X	X	10			ra, z
3355	INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.	2 TF		X	X	X	X	5			ra, z
3374	ACETYLENE, SOLVENT FREE	2 F		X			X	5	60		c, p

(a) Not applicable for pressure receptacles made of composite materials.

(b) For mixtures of UN No. 1965, the maximum permissible filling mass per litre of capacity is as follows:



(c) Considered as pyrophoric.

(d) Considered to be toxic. The LC_{50} value still to be determined.

Table 3: Substances not in class 2

UN No.	Name and description	Class	Classification Code	LC_{50} ml/m^3	Cylinders	Tubes	Pressure drums	Bundles of cylinders	Test period, years[a]	Test pressure, bar	Filling ratio	Special packing provisions
1051	HYDROGEN CYANIDE, STABILIZED containing less than 3% water	6.1	TF1	40	X			X	5	100	0.55	k
1052	HYDROGEN FLUORIDE, ANHYDROUS	8	CT1	966	X		X	X	5	10	0.84	ab,ac
1745	BROMINE PENTAFLUORIDE	5.1	OTC	25	X		X	X	5	10	(b)	k,ab,ad,
1746	BROMINE TRIFLUORIDE	5.1	OTC	50	X		X	X	5	10	(b)	k,ab,ad
1790	HYDROFLUORIC ACID, solution, with more than 85 % hydrofluoric acid	8	CT1	966	X		X	X	5	10	0.84	ab,ac
2495	IODINE PENTAFLUORIDE	5.1	OTC	120	X		X	X	5	10	(b)	k,ab,ad

[a] Not applicable for pressure receptacles made of composite materials.

[b] A minimum ullage of 8% by volume is required.

P 201	**PACKING INSTRUCTION**	**P 201**

This instruction applies to UN Nos. 3167, 3168 and 3169.

The following packagings are authorized:

(1) Cylinders tubes and pressure drums conforming to the construction, testing and filling requirements approved by the competent authority;

(2) In addition, the following packagings are authorized provided that the general provisions of 4.1.1 and 4.1.3 are met.

(a) For non-toxic gases, combination packagings with hermetically sealed inner packagings of glass or metal with a maximum capacity of 5 litres per package which meet the packing group III performance level;

(b) For toxic gases, combination packagings with hermetically sealed inner packagings of glass or metal with a maximum capacity of 1 litre per package which meet the packing group III performance level.

P 202	**PACKING INSTRUCTION**	**P 202**

(Reserved)

Type of packagings

Cryogenic receptacles

General instructions

(1) The special packing provisions of 4.1.6 shall be met.

(2) The receptacles shall be so insulated that they cannot become coated with dew or hoar-frost.

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

Particular instructions for closed cryogenic receptacles

(4) Closed cryogenic receptacles constructed as specified in Chapter 6.2 are authorized for the carriage of refrigerated liquefied gases.

(5) Test pressure

Refrigerated liquids shall be filled in closed cryogenic receptacles with the following minimum test pressures:

(a) For closed cryogenic receptacles with vacuum insulation, the test pressure shall not be less than 1.3 times the sum of the maximum internal pressure of the filled receptacle, including during filling and discharge, plus 100 kPa (1 bar);

(b) For other closed cryogenic receptacles, the test pressure shall be not less than 1.3 times the maximum internal pressure of the filled receptacle, taking into account the pressure developed during filling and discharge.

(6) Degree of filling

For non-flammable, non-toxic refrigerated liquefied gases (classification codes 3A and 3O) the volume of liquid phase at the filling temperature and at a pressure of 100 kPa (1 bar) shall not exceed 98% of the water capacity of the pressure receptacle.

For flammable refrigerated liquefied gases (classification code 3F) the degree of filling shall remain below the level at which, if the contents were raised to the temperature at which the vapour pressure equalled the opening pressure of the relief valve, the volume of the liquid phase would reach 98% of the water capacity at that temperature.

(7) Pressure-relief devices

Closed cryogenic receptacles shall be fitted with at least one pressure-relief device.

(8) Compatibility

Materials used to ensure the leakproofness of the joints or for the maintenance of the closures shall be compatible with the contents. For oxidizing gases (classification code 3O) see also (3) above.

(9) Periodic inspection

Receptacles shall be subjected to periodic inspections in accordance with the provisions of 6.2.1.6 and 6.2.3.5 respectively.

Periodic inspections shall be carried out every 10 years.

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

Particular instructions for open cryogenic receptacles

(10) Open cryogenic receptacles are not allowed for flammable refrigerated liquefied gases of classification code 3F, and UN No. 2187 carbon dioxide, refrigerated liquid and its mixtures.

(11) The receptacles shall be equipped with devices which prevent the liquid from splashing out.

(12) Glass receptacles shall be double-walled vacuum insulated and surrounded by an absorbent insulating material; they shall be protected by iron-wire baskets and placed in metal cases. The metal cases for the glass receptacles and the other receptacles shall be fitted with means of handling.

(13) The openings of the receptacles shall be fitted with devices allowing gases to escape, preventing any splashing

out of the liquid, and so fixed that they cannot fall out.

(14) In the case of UN No. 1073 oxygen refrigerated liquid and mixtures thereof, the devices referred to above and the absorbent insulating material surrounding the glass receptacles shall be made of incombustible materials.

Reference to standards

(Reserved)

P 204	PACKING INSTRUCTION	P 204

(Deleted)

P 205	PACKING INSTRUCTION	P 205

(deleted)

P 206	PACKING INSTRUCTION	P 206

This packing instruction applies to UN No. 3150 devices, small, hydrocarbon gas powered or hydrocarbon gas refills for small devices

(1) The special packing provisions of 4.1.6 when applicable shall be met.

(2) The articles shall comply with the provisions of the country in which they were filled.

(3) The devices and refills shall be packed in outer packagings conforming to 6.1.4 tested and approved in accordance with Chapter 6.1 for packing group II.

P 300	PACKING INSTRUCTION	P 300

This instruction applies to UN No. 3064.

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

Combination packagings consisting of inner metal cans of not more than 1 litre capacity each and outer wooden boxes (4C1, 4C2, 4D or 4F) containing not more than 5 litres of solution.

Additional requirements

1. Metal cans shall be completely surrounded with absorbent cushioning material.
2. Wooden boxes shall be completely lined with suitable material impervious to water and nitroglycerin.

P 301	PACKING INSTRUCTION	P 301

This instruction applies to UN No. 3165.

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) Aluminium pressure vessel made from tubing and having welded heads.

Primary containment of the fuel within this vessel shall consist of a welded aluminium bladder having a maximum internal volume of 46 litres.

The outer vessel shall have a minimum design gauge pressure of 1 275 kPa and a minimum burst gauge pressure of 2 755 kPa.

Each vessel shall be leak checked during manufacture and before dispatch and shall be found leakproof.

The complete inner unit shall be securely packed in non-combustible cushioning material, such as vermiculite, in a strong outer tightly closed metal packaging which will adequately protect all fittings.

Maximum quantity of fuel per unit and package is 42 litres;

(2) Aluminium pressure vessel.

Primary containment of the fuel within this vessel shall consist of a welded vapour tight fuel compartment with an elastomeric bladder having a maximum internal volume of 46 litres.

The pressure vessel shall have a minimum design gauge pressure of 2 860 kPa and a minimum burst gauge pressure of 5 170 kPa.

Each vessel shall be leak-checked during manufacture and before dispatch and shall be securely packed in non-combustible cushioning material such as vermiculite, in a strong outer tightly closed metal packaging which will adequately protect all fittings.

Maximum quantity of fuel per unit and package is 42 litres.

P 302	PACKING INSTRUCTION	P 302

This instruction applies to UN No. 3269.

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

Combination packagings which meet the packing group II or III performance level according to the criteria for Class 3, applied to the base material.

The base material and the activator (organic peroxide) shall be each separately packed in inner packagings.

The components may be placed in the same outer packaging provided they will not interact dangerously in the event of a leakage.

The activator shall have a maximum quantity of 125 ml per inner packaging if liquid, and 500 g per inner packaging if solid.

P 400	PACKING INSTRUCTION	P 400

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met. They shall be made of steel and shall be subjected to an initial test and periodic tests every 10 years at a pressure of not less than 1 MPa (10 bar, gauge pressure). During carriage, the liquid shall be under a layer of inert gas with a gauge pressure of not less than 20 kPa (0.2 bar);

(2) Boxes (4A, 4B, 4C1, 4C2, 4D, 4F or 4G), drums (1A2, 1B2, 1N2, 1D or 1G) or jerricans (3A2 or 3B2) enclosing hermetically sealed metal cans with inner packagings of glass or metal, with a capacity of not more than 1 litre each, having threaded closures with gaskets. Inner packagings shall be cushioned on all sides with dry, absorbent, non-combustible material in a quantity sufficient to absorb the entire contents. Inner packagings shall not be filled to more than 90% of their capacity. Outer packagings shall have a maximum net mass of 125 kg;

(3) Steel, aluminium or metal drums (1A2, 1B2 or 1N2), jerricans (3A2 or 3B2) or boxes (4A or 4B) with a maximum net mass of 150 kg each with hermetically sealed inner metal cans not more than 4 litre capacity each, with threaded closures fitted with gaskets. Inner packagings shall be cushioned on all sides with dry, absorbent, non-combustible material in a quantity sufficient to absorb the entire contents. Each layer of inner packagings shall be separated by a dividing partition in addition to cushioning material. Inner packagings shall not be filled to more than 90% of their capacity.

Special packing provision

PP 86	For UN Nos. 3392 and 3394, air shall be eliminated from the vapour space by nitrogen or other means.

P 401	PACKING INSTRUCTION	P 401

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met. They shall be made of steel and subjected to an initial test and periodic tests every 10 years at a pressure of not less than 0.6 MPa (6 bar, gauge pressure). During carriage, the liquid shall be under a layer of inert gas with a gauge pressure of not less than 20 kPa (0.2 bar);

	Inner packaging	Outer packaging
(2) Combination packagings with inner packagings of glass metal or plastics which have threaded closures surrounded in inert cushioning and absorbent material in a quantity sufficient to absorb the entire contents.	1 l	30 kg (maximum net mass)

Special packing provision specific to RID and ADR

PR 7	For UN Nos. 1183, 1242, 1295 and 2988, the pressure receptacles shall however be subjected to the tests every five years.

P 402	PACKING INSTRUCTION	P 402

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met. They shall be made of steel and subjected to an initial test and periodic tests every 10 years at a pressure of not less than 0.6 MPa (6 bar, gauge pressure). During carriage, the liquid shall be under a layer of inert gas with a gauge pressure of not less than 20 kPa (0.2 bar);

		Inner packaging	Outer packaging
		Maximum net mass	
(2)	Combination packagings with inner packagings of glass, metal or plastics which have threaded closures surrounded in inert cushioning and absorbent material in a quantity sufficient to absorb the entire contents.	10 kg (glass) 15 kg (metal or plastics)	125 kg 125 kg

(3) Steel drums (1A1) with a maximum capacity of 250 litres.

(4) Composite packagings consisting of a plastics receptacle with outer steel drum or aluminium (6HA1 or 6HB1) with a maximum capacity of 250 litres.

Special packing provision specific to RID and ADR

RR 4	For UN No. 3130, the openings of receptacles shall be tightly closed by means of two devices in series, one of which shall be screwed or secured in an equivalent manner.
RR 7	For UN No. 3129, the pressure receptacles shall however be subjected to the tests every five years.
RR 8	For UN Nos. 1389, 1391, 1411, 1421, 1928, 3129, 3130 and 3148, the pressure receptacles shall however be subjected to an initial test and to periodic tests at a pressure of not less than 1 MPa (10 bar).

P 403	PACKING INSTRUCTION	P 403

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

Combination packagings			Maximum net mass
Inner packagings		**Outer packagings**	
Glass	2 kg	**Drums**	
Plastics	15 kg	steel (1A2)	400 kg
Metal	20 kg	aluminium (1B2)	400 kg
		metal, other than steel or aluminium (1N2)	400 kg
Inner packagings shall be hermetically sealed (e.g. by taping or by threaded closures).		plastics (1H2)	400 kg
		plywood (1D)	400 kg
		fibre (1G)	400 kg
		Boxes	
		steel (4A)	400 kg
		aluminium (4B)	400 kg
		natural wood (4C1)	250 kg
		natural wood with sift proof walls (4C2)	250 kg
		plywood (4D)	250 kg
		reconstituted wood (4F)	125 kg
		fibreboard (4G)	125 kg
		expanded plastics (4H1)	60 kg
		solid plastics (4H2)	250 kg
		Jerricans	
		steel (3A2)	120 kg
		aluminium (3B2)	120 kg
		plastics (3H2)	120 kg

Single packagings	Maximum net mass
Drums	
steel (1A1, 1A2)	250 kg
aluminium (1B1, 1B2)	250 kg
metal other than steel or aluminium (1N1, 1N2)	250 kg
plastics (1H1, 1H2)	250 kg
Jerricans	
steel (3A1, 3A2)	120 kg
aluminium (3B1, 3B2)	120 kg
plastics (3H1, 3H2)	120 kg
Composite packagings	
plastics receptacle with outer steel or aluminium drums (6HA1 or 6HB1)	250 kg
plastics receptacle with outer fibre, plastics or plywood drums (6HG1, 6HH1 or 6HD1)	75 kg
plastics receptacle with outer steel or aluminium crate or box or with outer wooden, plywood, fibreboard or solid plastics boxes (6HA2, 6HB2, 6HC, 6HD2, 6HG2 oder 6HH2)	75 kg
Pressure receptacles, provided that the general provisions of 4.1.3.6 are met.	

Additional requirement

Packagings shall be hermetically sealed.

Special packing provision

PP 83	For UN No. 2813, waterproof bags containing not more than 20 g of substance for the purposes of heat formation may be packaged for carriage. Each waterproof bag shall be sealed in a plastics bag and placed within an intermediate packaging. No outer packaging shall contain more than 400 g of substance. Water or liquid which may react with the water reactive substance shall not be included in the packaging.

P 404	PACKING INSTRUCTION	P 404

This instruction applies to pyrophoric solids: UN Nos.: 1383, 1854, 1855, 2008, 2441, 2545, 2546, 2846, 2881, 3200, 3391 and 3393.

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) Combination packagings

Outer packagings: (1A2, 1B2, 1N2, 1H2, 1D, 4A, 4B, 4C1, 4C2, 4D, 4F or 4H2)

Inner packagings: Metal packagings with a capacity of not more than 15kg each. Inner packagings shall be hermetically sealed and have threaded closures;

(2) Metal packagings: (1A1, 1A2, 1B1, 1N1, 1N2, 3A1, 3A2, 3B1 and 3B2)

Maximum gross mass: 150 kg

(3) Composite packagings: Plastics receptacle with outer steel or aluminium drum (6HA1 or 6HB1)

Maximum gross mass: 150 kg

Pressure receptacles, provided that the general provisions of 4.1.3.6 are met.

Special packing provision

PP 86	For UN Nos. 3391 and 3393, air shall be eliminated from the vapour space by nitrogen or other means.

P 405	PACKING INSTRUCTION	P 405

This instruction applies to UN No. 1381.

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) For UN No. 1381, phosphorus, wet:

(a) Combination packagings

Outer packagings: (4A, 4B, 4C1, 4C2, 4D or 4F)

Maximum net mass: 75 kg

Inner packagings:

(i) hermetically sealed metal cans, with a maximum net mass of 15kg; or

(ii) glass inner packagings cushioned on all sides with dry, absorbent, non-combustible material in a quantity sufficient to absorb the entire contents with a maximum net mass of 2 kg; or

(b) Drums (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2); maximum net mass: 400 kg

Jerricans (3A1 oder 3B1); maximum net mass: 120 kg.

These packagings shall be capable of passing the leakproofness test specified in 6.1.5.4 at the packing group II performance level;

(2) For UN No. 1381, dry phosphorus:

(a) When fused, drums (1A2, 1B2 or 1N2) with a maximum net mass of 400 kg; or

(b) In projectiles or hard cased articles when carried without Class 1 components: as specified by the competent authority.

P 406	PACKING INSTRUCTION	P 406

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) Combination packagings

outer packagings: (4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2, 1G, 1D, 1H2 or 3H2)

inner packagings: water-resistant packagings;

(2) Plastics, plywood or fibreboard drums (1H2, 1D or 1G) or boxes (4A, 4B, 4C1, 4C2, 4D, 4F, 4G and 4H2) with a water resistant inner bag, plastics film lining or water resistant coating;

(3) Metal drums (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2), plastics drums (1H1 or 1H2), metal jerricans (3A1, 3A2, 3B1 or 3B2), plastics jerricans (3H1 or 3H2), plastics receptacle with outer steel or aluminium drums (6HA1 or 6HB1), plastics receptacle with outer fibre, plastics or plywood drums (6HG1, 6HH1 or 6HD1),), plastics receptacle with outer steel or aluminium crate or box or with outer wooden, plywood, fibreboard or solid plastics boxes (6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2).

Additional requirements

1. Packagings shall be designed and constructed to prevent the loss of water or alcohol content or the content of the phlegmatizer.
2. Packagings shall be so constructed and closed so as to avoid an explosive overpressure or pressure build-up of more than 300 kPa (3 bar).

Special packing provisions

PP 24	UN Nos. 2852, 3364, 3365, 3366, 3367, 3368 and 3369 shall not be carried in quantities of more than 500 g per package.
PP 25	For UN No. 1347, the quantity carried shall not exceed 15 kg per package.
PP 26	For UN Nos. 1310, 1320, 1321, 1322, 1344, 1347, 1348, 1349, 1517, 2907, 3317 and 3376 packagings shall be lead free.
PP 48	For UN No. 3474, metal packagings shall not be used.
PP 78	UN No. 3370 shall not be carried in quantities of more than 11.5 kg per package.
PP 80	For UN No. 2907 packagings shall meet the packing group II performance level. Packagings meeting the test criteria of packing group I shall not be used.

P 407	PACKING INSTRUCTION	P 407

This instruction applies to UN Nos. 1331, 1944, 1945 and 2254.

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

Combination packagings comprising securely closed inner packagings to prevent accidental ignition under normal conditions of transport. The maximum gross mass of the package shall not exceed 45 kg except for fibreboard boxes which shall not exceed 30 kg.

Additional requirement

Matches shall be tightly packed.

Special packing provision

PP 27	UN No. 1331, Strike-anywhere matches shall not be packed in the same outer packaging with any other dangerous goods other than safety matches or wax Vesta matches, which shall be packed in separate inner packagings. Inner packagings shall not contain more than 700 strike-anywhere matches.

P 408	PACKING INSTRUCTION	P 408

This instruction applies to UN No. 3292.

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) For cells:

Outer packagings with sufficient cushioning material to prevent contact between cells and between cells and the internal surfaces of the outer packaging and to ensure that no dangerous movement of the cells within the outer packaging occurs during carriage. Packagings shall conform to the packing group II performance level;

(2) For batteries:

Batteries may be carried unpacked or in protective enclosures (e.g. in fully enclosed or wooden slatted crates). The terminals shall not support the weight of other batteries or materials packed with the batteries.

Additional requirement

Batteries shall be protected against short circuit and shall be isolated in such a manner as to prevent short circuits.

P 409	PACKING INSTRUCTION	P 409

This instruction applies to UN Nos. 2956, 3242 and 3251.

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) Fibre drum (1G) which may be fitted with a liner or coating; maximum net mass: 50 kg;

(2) Combination packagings: Fibreboard box (4G) with a single inner plastic bag; maximum net mass: 50 kg;

(3) Combination packagings: Fibreboard box (4G) or fibre drum (1G) with plastics inner packagings each containing a maximum of 5 kg; maximum net mass: 25 kg.

P 410	PACKING INSTRUCTION	P 410

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

Combination packagings		Maximum net mass	
Inner packagings	**Outer packagings**	**Packing group II**	**Packing group III**
Glass 10 kg Plastics[a] 30 kg Metal 40 kg Paper[a],[b] 10 kg Fibre[a],[b] 10 kg [a] These packagings shall be sift-proof. [b] These inner packagings shall not be used when the substances being carried may become liquid during carriage.	**Drums**		
	steel (1A2)	400 kg	400 kg
	aluminium (1B2)	400 kg	400 kg
	metal other than steel or aluminium (1N2)	400 kg	400 kg
	plastics (1H2)	400 kg	400 kg
	plywood (1D)	400 kg	400 kg
	fibre (1G)[a]	400 kg	400 kg
	Boxes		
	steel (4A)	400 kg	400 kg
	aluminium (4B)	400 kg	400 kg
	natural wood (4C1)	400 kg	400 kg
	natural wood with sift-proof walls (4C2)	400 kg	400 kg
	plywood (4D)	400 kg	400 kg
	reconstituted wood (4F)	400 kg	400 kg
	fibreboard (4G)[a]	400 kg	400 kg
	expanded plastics (4H1)	60 kg	60 kg
	solid plastics (4H2)	400 kg	400 kg
	Jerricans		
	steel (3A2)	120 kg	120 kg
	aluminium (3B2)	120 kg	120 kg
	plastics (3H2)	120 kg	120 kg

Single packagings		
Drums		
steel (1A1 or 1A2)	400 kg	400 kg
aluminium (1B1 or 1B2)	400 kg	400 kg
metal other than steel or aluminium (1N1 or 1N2)	400 kg	400 kg
plastics (1H1 or 1H2)	400 kg	400 kg
Jerricans		
steel (3A1 oder 3A2)	120 kg	120 kg
aluminium (3B1 oder 3B2)	120 kg	120 kg
plastics (3H1 oder 3H2)	120 kg	120 kg
Boxes		
steel (4A)[c]	400 kg	400 kg
aluminium (4B)[c]	400 kg	400 kg
natural wood (4C1)[c]	400 kg	400 kg
plywood (4D)[c]	400 kg	400 kg
reconstituted wood (4F)[c]	400 kg	400 kg
natural wood with sift-proof walls (4C2)[c]	400 kg	400 kg
fibreboard (4G)[c]	400 kg	400 kg
solid plastics (4H2)[c]	400 kg	400 kg
Bags		
Bags (5H3, 5H4, 5L3, 5M2)[c],[d]	50 kg	50 kg

[c] These packagings shall not be used when the substances being carried may become liquid during carriage.
[d] These packagings shall only be used for packing group II substances when carried in a covered wagon or closed container.

Composite packagings		
plastics receptacle with outer steel, aluminium, plywood, fibre or plastics drum (6HA1, 6HB1, 6HG1, 6HD1 or 6HH1)	400 kg	400 kg
plastics receptacle with outer steel or aluminium crate or box, or outer wooden, plywood, fibreboard or solid plastics box (6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2)	75 kg	75 kg
glass receptacle with outer steel, aluminium, plywood or fibre drum (6PA1, 6PB1, 6PD1 or 6PG1) or outer steel or aluminium crate or box or with outer wooden or fibreboard box or with outer wickerwork hamper (6PA2, 6PB2, 6PC, 6PG2 or 6PD2) or with outer solid or expanded plastics packaging (6PH1 or 6PH2)	75 kg	75 kg

Pressure receptacles, provided that the general provisions of 4.1.3.6 are met.

Special packing provisions	
PP 39	For UN No. 1378, for metal packagings a venting device is required.
PP 40	For UN Nos. 1326, 1352, 1358, 1395, 1396, 1436, 1437, 1871, 2805 and 3182, packing group II, bags are not allowed.
PP 83	For UN No. 2813, waterproof bags containing not more than 20 g of substance for the purposes of heat formation may be packaged for carriage. Each waterproof bag shall be sealed in a plastics bag and placed within an intermediate packaging. No outer packaging shall contain more than 400 g of substance. Water or liquid which may react with the water reactive substance shall not be included in the packaging.

P 411	**PACKING INSTRUCTION**	**P 411**

This instruction applies to UN No. 3270.

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

(1) Fibreboard box with a maximum gross mass of 30 kg;

(2) Other packagings, provided that explosion is not possible by reason of increased internal pressure. Maximum net mass shall not exceed 30 kg.

P 500	PACKING INSTRUCTION	P 500

This instruction applies to UN No. 3356.

The general provisions of 4.1.1 and 4.1.3 shall be met.

Packagings shall conform to the packing group II performance level.

The generator(s) shall be carried in a package which meets the following requirements when one generator in the package is actuated:

(a) Other generators in the package will not be actuated;

(b) Packaging material will not ignite; and

(c) The outside surface temperature of the completed package shall not exceed 100 °C.

P 501	PACKING INSTRUCTION	P 501

This instruction applies to UN No. 2015.

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

Combination packagings	Inner packaging maximum capacity	Outer packaging maximum net mass
(1) Boxes (4A, 4B, 4C1, 4C2, 4D, 4H2) or drums (1A2, 1B2, 1N2, 1H2, 1D) or jerricans (3A2, 3B2, 3H2) with glass, plastics or metal inner packagings	5 l	125 kg
(2) Fibreboard box (4G) or fibre drum (1G) with plastics or metal inner packagings each in a plastics bag	2 l	50 kg

Single packagings	Maximum capacity
Drums	
steel (1A1)	250 l
aluminium (1B1)	250 l
metal other than steel or aluminium (1N1)	250 l
plastics (1H1)	250 l
Jerricans	
steel (3A1)	60 l
aluminium (3B1)	60 l
plastics (3H1)	60 l
Composite packagings	
plastics receptacle with outer steel or aluminium drum (6HA1, 6HB1)	250 l
plastics receptacle with outer fibre, plastics or plywood drum (6HG1, 6HH1, 6HD1)	250 l
plastics receptacle with outer steel or aluminium crate or box or plastics receptacle with outer wooden, plywood, fibreboard or solid plastics box (6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2)	60 l
glass receptacle with outer steel, aluminium, fibre, plywood, solid plastics or expanded plastics drum (6PA1, 6PB1, 6PG1, 6PD1, 6PH1 or 6PH2) or with outer steel or aluminium crate or box or with outer wooden or fibreboard box or with outer wickerwork hamper (6PA2, 6PB2, 6PC, 6PG2 or 6PD2)	60 l

Additional requirements

1. Packagings shall have a maximum filling degree of 90%.
2. Packagings shall be vented.

P 502	PACKING INSTRUCTION	P 502

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

Combination packagings			Maximum net mass
Inner packagings		Outer packagings	
Glass	5 l	**Drums**	
Metal	5 l	steel (1A2)	125 kg
Plastics	5 l	aluminium (1B2)	125 kg
		metal other than steel or aluminium (1N2)	125 kg
		plastics (1H2)	125 kg
		plywood (1D)	125 kg
		fibre (1G)	125 kg
		Boxes	
		steel (4A)	125 kg
		aluminium (4B)	125 kg
		natural wood (4C1)	125 kg
		natural wood with sift-proof walls (4C2)	125 kg
		plywood (4D)	125 kg
		reconstituted wood (4F)	125 kg
		fibreboard (4G)	125 kg
		expanded plastics (4H1)	60 kg
		solid plastics (4H2)	125 kg

Single packagings	Maximum capacity
Drums	
steel (1A1)	250 l
aluminium (1B1)	250 l
plastics (1H1)	250 l
Jerricans	
steel (3A1)	60 l
aluminium (3B1)	60 l
plastics (3H1)	60 l
Composite packagings	
plastics receptacle with outer steel or aluminium drum (6HA1 or 6HB1)	250 l
plastics receptacle with outer fibre, plastics or plywood drum (6HG1, 6HH1 or 6HD1)	250 l
plastics receptacle with outer steel or aluminium crate or box or plastics receptacle with outer wooden, plywood, fibreboard or solid plastics box (6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2)	60 l
glass receptacle with outer steel, aluminium, fibre, plywood, solid plastics or expanded plastics drum (6PA1, 6PB1, 6PG1, 6PD1, 6PH1 or 6PH2) or with outer steel or aluminium crate or box or with outer wooden or fibreboard box or with outer wickerwork hamper (6PA2, 6PB2, 6PC, 6PG2 or 6PD2)	60 l

Special packing provision

PP 28	For UN No. 1873, only glass inner packagings and glass inner receptacles are authorized respectively for combination packagings and composite packagings.

P 503	PACKING INSTRUCTION	P 503

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

Combination packagings		Maximum net mass
Inner packagings	**Outer packagings**	
Glass 5 kg Metal 5 kg Plastics 5 kg	**Drums**	
	steel (1A2)	125 kg
	aluminium (1B2)	125 kg
	metal other than steel or aluminium (1N2)	125 kg
	plastics (1H2)	125 kg
	plywood (1D)	125 kg
	fibre (1G)	125 kg
	Boxes	
	steel (4A)	125 kg
	aluminium (4B)	125 kg
	natural wood (4C1)	125 kg
	natural wood with sift-proof walls (4C2)	125 kg
	plywood (4D)	125 kg
	reconstituted wood (4F)	125 kg
	fibreboard (4G)	40 kg
	expanded plastics (4H1)	60 kg
	solid plastics (4H2)	125 kg

Single packagings

Metal drums (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2)) with a maximum net mass of 250 kg.
Fibreboard (1G) or plywood drums (1D) fitted with inner liners with a maximum net mass of 200 kg.

P 504	PACKING INSTRUCTION	P 504

The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:

Combination packagings	**Maximum net mass**
(1) Glass receptacles with a maximum capacity of 5 litres in 1A2, 1B2, 1N2, 1H2, 1D, 1G, 4A, 4B, 4C1, 4C2, 4D, 4F, 4G, 4H2 outer packagings	75 kg
(2) Plastics receptacles with a maximum capacity of 30 litres in 1A2, 1B2, 1N2, 1H2, 1D, 1G, 4A, 4B, 4C1, 4C2, 4D, 4F, 4G, 4H2 outer packagings	75 kg
(3) Metal receptacles with a maximum capacity of 40 litres in 1G, 4F or 4G outer packagings	125 kg
(4) Metal receptacles with a maximum capacity of 40 litres in 1A2, 1B2, 1N2, 1H2, 1D, 4A, 4B, 4C1, 4C2, 4D, 4H2 outer packagings	225 kg
Single packagings	**Maximum capacity**
Drums	
steel, non-removable head (1A1)	250 l
steel, removable head (1A2)	250 l
aluminium, non-removable head (1B1)	250 l
aluminium, removable head (1B2)	250 l
metal other than steel or aluminium, non-removable head (1N1)	250 l
metal other than steel or aluminium, removable head (1N2)	250 l
plastics, non-removable head (1H1)	250 l
plastics, removable head (1H2)	250 l
Jerricans	
steel, non-removable head (3A1)	60 l
steel, removable head (3A2)	60 l
aluminium, non-removable head (3B1)	60 l
aluminium, removable head (3B2)	60 l
plastics, non-removable head (3H1)	60 l
plastics, removable head (3H2)	60 l
Composite packagings	
plastics receptacle with outer steel or aluminium drum (6HA1 or 6HB1)	250 l
plastics receptacle with outer fibre, plastics or plywood drum (6HG1, 6HH1 or 6HD1)	120 l
plastics receptacle with outer steel or aluminium crate or box or plastics receptacle with outer wooden, plywood, fibreboard or solid plastics box (6HA2, 6HB2, 6HC, 6HD2, 6HG2 or 6HH2)	60 l
glass receptacle with outer steel, aluminium, fibre, plywood, solid plastics or expanded plastics drum (6PA1, 6PB1, 6PG1, 6PD1, 6PH1 or 6PH2) or with outer steel or aluminium crate or box or with outer wooden fibreboard box or with outer wickerwork hamper (6PA2, 6PB2, 6PC, 6PG2 or 6PD2)	60 l

Special packing provision

PP 10	For UN Nos. 2014, 2984 and 3149, the packaging shall be vented.

P 520	PACKING INSTRUCTION	P 520

This instruction applies to organic peroxides of Class 5.2 and self-reactive substances of Class 4.1.

The packagings listed below are authorized provided the general provisions of 4.1.1 and 4.1.3 and special provisions of 4.1.7.1 are met.

The packing methods are designated OP1 to OP8. The packing methods appropriate for the individual currently assigned organic peroxides and self-reactive substances are listed in 4.1.7.1.3, 2.2.41.4 and 2.2.52.4. The quantities specified for each packing method are the maximum quantities authorized per package.

The following packagings are authorized:

(1) Combination packagings with outer packagings comprising boxes (4A, 4B, 4C1, 4C2, 4D, 4F, 4G, 4H1 and 4H2), drums (1A2, 1B2, 1G, 1H2 and 1D), jerricans (3A2, 3B2 and 3H2);

(2) Single packagings consisting of drums (1A1, 1A2, 1B1, 1B2, 1G, 1H1, 1H2 and 1D) and jerricans (3A1, 3A2, 3B1, 3B2, 3H1 and 3H2);

(3) Composite packagings with plastics inner receptacles (6HA1, 6HA2, 6HB1, 6HB2, 6HC, 6HD1, 6HD2, 6HG1, 6HG2, 6HH1 and 6HH2).

Maximum quantity per packaging/package[(a)] for packing methods OP1 to OP8

Maximum Quantity	Packing Method							
	OP1	OP2[(a)]	OP3	OP4[(a)]	OP5	OP6	OP7	OP8
Maximum mass (kg) for solids and for combination packagings (liquid and solid)	0,5	0,5 / 10	5	5 / 25	25	50	50	400[(b)]
Maximum contents in litres for liquids[(c)]	0,5	-	5	-	30	60	60	225[(d)]

(a) If two values are given, the first applies to the maximum net mass per inner packaging and the second to the maximum net mass of the complete package.

(b) 60 kg for jerricans / 200 kg for boxes and, for solids, 400 kg in combination packagings with outer packagings comprising boxes (4C1, 4C2, 4D, 4F, 4G, 4H1 and 4H2) and with inner packagings of plastics or fibre with a maximum net mass of 25 kg.

(c) Viscous substances shall be treated as solids when they do not meet the criteria provided in the definition for "liquids" presented in 1.2.1.

(d) 60 litres for jerricans.

Additional requirements

1. Metal packagings, including inner packagings of combination packagings and outer packagings of combination or composite packagings may only be used for packing methods OP7 and OP8.
2. In combination packagings, glass receptacles may only be used as inner packagings with maximum contents of 0.5 kg for solids or 0.5 litre for liquids.
3. In combination packagings, cushioning materials shall not be readily combustible.
4. The packaging of an organic peroxide or self-reactive substance required to bear an "EXPLOSIVE" subsidiary risk label (model No.1, see 5.2.2.2.2) shall also comply with the provisions given in 4.1.5.10 and 4.1.5.11.

Special packing provisions

PP 21	For certain self-reactive substances of types B or C, UN Nos. 3221, 3222, 3223 and 3224, a smaller packaging than that allowed by packing methods OP5 or OP6 respectively shall be used (see 4.1.7 and 2.2.41.4).
PP 22	UN No. 3241, 2-Bromo-2-nitropropane-1, 3-diol, shall be packed in accordance with packing method OP6.

P 600	PACKING INSTRUCTION	P 600

This instruction applies to UN Nos. 1700, 2016 and 2017.

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

Outer packagings (1A2, 1B2, 1N2, 1H2, 1D, 1G, 4A, 4B, 4C1, 4C2, 4D, 4F, 4G, 4H2) meeting the packing group II performance level. The articles shall be individually packaged and separated from each other using partitions, dividers, inner packagings or cushioning material to prevent inadvertent discharge during normal conditions of carriage.
Maximum net mass: 75 kg

P 601	PACKING INSTRUCTION	P 601

The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met and the packagings are hermetically sealed:

(1) Combination packagings with a maximum gross mass of 15 kg, consisting of

- one or more glass inner packaging(s) with a maximum capacity of 1 litre each and filled to not more than 90% of their capacity; the closure(s) of which shall be physically held in place by any means capable of preventing back-off or loosening by impact or vibration during carriage, individually placed in
- metal receptacles together with cushioning and absorbent material sufficient to absorb the entire contents of the glass inner packaging(s), further packed in
- 1A2, 1B2, 1N2, 1H2, 1D, 1G, 4A, 4B, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings;

(2) Combination packagings consisting of metal inner packagings not exceeding 5 litres in capacity individually packed with absorbent material sufficient to absorb the contents and inert cushioning material in 1A2, 1B2, 1N2, 1H2, 1D, 1G, 4A, 4B, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings with a maximum gross mass of 75 kg. Inner packagings shall not be filled to more than 90% of their capacity. The closure of each inner packaging shall be physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during carriage;

(3) Packagings consisting of:

Outer packagings: Steel or plastic drums, removable head (1A2 or 1H2), tested in accordance with the test requirements in 6.1.5 at a mass corresponding to the mass of the assembled package either as a packaging intended to contain inner packagings, or as a single packaging intended to contain solids or liquids, and marked accordingly;

Inner packagings:

Drums and composite packagings (1A1, 1B1, 1N1, 1H1 or 6HA1) meeting the requirements of Chapter 6.1 for single packagings, subject to the following conditions:

(a) The hydraulic pressure test shall be conducted at a pressure of at least 0.3 MPa (gauge pressure);

(b) The design and production leakproofness tests shall be conducted at a test pressure of 30 kPa;

(c) They shall be isolated from the outer drum by the use of inert shock-mitigating cushioning material which surrounds the inner packaging on all sides;

(d) Their capacity shall not exceed 125 litres;

(e) Closures shall be of a screw cap type that are:

(i) physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during carriage; and

(ii) provided with a cap seal;

(f) The outer and inner packagings shall be subjected periodically to a leakproofness test according to (b) at intervals of not more than two and a half years;

(g) The complete packaging shall be visually inspected to the satisfaction of the competent authority at least every 3 years;

(h) The outer and inner packaging shall bear in clearly legible and durable characters:

(i) the date (month, year) of the initial test and the latest periodic test and inspection;

(ii) The stamp of the expert who carried out the test and inspection;

(4) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met. They shall be subjected to an initial test and periodic tests every 10 years at a pressure of not less than 1 MPa (10 bar) (gauge pressure). Pressure receptacles may not be equipped with any pressure relief device. Each pressure receptacle containing a toxic by inhalation liquid with an LC_{50} less than or equal to 200 ml/m^3 (ppm) shall be closed with a plug or valve conforming to the following:

(a) Each plug or valve shall have a taper-threaded connection directly to the pressure receptacle and be capable of withstanding the test pressure of the pressure receptacle without damage or leakage;

(b) Each valve shall be of the packless type with non-perforated diaphragm, except that, for corrosive substances, a valve may be of the packed type with an assembly made gas-tight by means of a seal cap with gasket joint attached to the valve body or the pressure receptacle to prevent loss of substance through or past the packing; (c) Each valve outlet shall be sealed by a threaded cap or threaded solid plug and inert gasket material; (d) The materials of construction for the pressure receptacle, valves, plugs, outlet caps, luting and gaskets shall be compatible with each other and with the contents. Each pressure receptacle with a wall thickness at any point of less than 2.0 mm and each pressure receptacle which does not have fitted valve protection shall be carried in an outer packaging. Pressure receptacles shall not be manifolded or interconnected.	
Special packing provision	
PP 82	(Deleted)
Special packing provision specific to RID and ADR	
RR 3	(Deleted)
RR 7	For UN No. 1251, the pressure receptacles shall however be subjected to the tests every five years.
RR 10	UN No. 1614, when completely absorbed by an inert porous material, shall be packed in metal receptacles of a capacity of not more than 7.5 litres, placed in wooden cases in such a manner that they cannot come into contact with one another. The receptacles shall be entirely filled with the porous material which shall not shake down or form dangerous spaces even after prolonged use or under impact, even at temperatures of up to 50 °C.

P 602	PACKING INSTRUCTION	P 602

The following packagings are authorised provided the general provisions of 4.1.1 and 4.1.3 are met and the packagings are hermetically sealed:

(1) Combination packagings with a maximum gross mass of 15 kg, consisting of

- one or more glass inner packaging(s) with a maximum capacity of 1 litre each and filled to not more than 90% of their capacity; the closure(s) of which shall be physically held in place by any means capable of preventing back-off or loosening by impact or vibration during carriage, individually placed in
- metal receptacles together with cushioning and absorbent material sufficient to absorb the entire contents of the glass inner packaging(s), further packed in
- 1A2, 1B2, 1N2, 1H2, 1D, 1G, 4A, 4B, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings;

(2) Combination packagings consisting of metal inner packagings individually packed with absorbent material sufficient to absorb the entire contents and inert cushioning material in 1A2, 1B2, 1N2, 1H2, 1D, 1G, 4A, 4B, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings with a maximum gross mass of 75 kg. Inner packagings shall not be filled to more than 90% of their capacity. The closure of each inner packaging shall be physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during carriage. Inner packagings shall not exceed 5 litres in capacity;

(3) Drums and composite packagings (1A1, 1B1, 1N1, 1H1, 6HA1 or 6HH1), subject to the following conditions:

a) The hydraulic pressure test shall be conducted at a pressure of at least 0.3 MPa (gauge pressure);

b) The design and production leakproofness tests shall be conducted at a test pressure of 30 kPa; and

c) Closures shall be of a screw cap type that are:

(i) physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during carriage; and

(ii) provided with a cap seal;

(4) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met. They shall be subjected to an initial test and periodic tests every 10 years at a pressure of not less than 1 MPa (10 bar) (gauge pressure). Pressure receptacles may not be equipped with any pressure relief device. Each pressure receptacle containing a toxic by inhalation liquid with an LC_{50} less than or equal to 200 ml/m^3 (ppm) shall be closed with a plug or valve conforming to the following:

(a) Each plug or valve shall have a taper-threaded connection directly to the pressure receptacle and be capable of withstanding the test pressure of the pressure receptacle without damage or leakage;

(b) Each valve shall be of the packless type with non-perforated diaphragm, except that, for corrosive substances, a valve may be of the packed type with an assembly made gas-tight by means of a seal cap with gasket joint attached to the valve body or the pressure receptacle to prevent loss of substance through or past the packing;

(c) Each valve outlet shall be sealed by a threaded cap or threaded solid plug and inert gasket material;

(d) The materials of construction for the pressure receptacle, valves, plugs, outlet caps, luting and gaskets shall be compatible with each other and with the contents.

Each pressure receptacle with a wall thickness at any point of less than 2.0 mm and each pressure receptacle which does not have fitted valve protection shall be carried in an outer packaging. Pressure receptacles shall not be manifolded or interconnected.

P 620	PACKING INSTRUCTION	P 620

This instruction applies to UN Nos. 2814 and 2900.

The following packagings are authorized provided the special packing provisions of 4.1.8 are met:

Packagings meeting the requirements of Chapter 6.3 and approved accordingly consisting of:

(a) Inner packagings comprising:

(i) leakproof primary receptacle(s);

(ii) a leakproof secondary packaging;

(iii) other than for solid infectious substances, an absorbent material in sufficient quantity to absorb the entire contents placed between the primary receptacle(s) and the secondary packaging; if multiple primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated so as to prevent contact between them;

(b) A rigid outer packaging. The smallest external dimension shall be not less than 100 mm.

Additional requirements

1. Inner packagings containing infectious substances shall not be consolidated with inner packagings containing unrelated types of goods. Complete packages may be overpacked in accordance with the provisions of 1.2.1 and 5.1.2; such an overpack may contain dry ice.
2. Other than for exceptional consignments, e.g. whole organs which require special packaging, the following additional requirements shall apply:
   (a) Substances consigned at ambient temperatures or at a higher temperature: Primary receptacles shall be of glass, metal or plastics. Positive means of ensuring a leakproof seal shall be provided, e.g. a heat seal, a skirted stopper or a metal crimp seal. If screw caps are used, they shall be secured by positive means, e.g., tape, paraffin sealing tape or manufactured locking closure;
   (b) Substances consigned refrigerated or frozen: Ice, dry ice or other refrigerant shall be placed around the secondary packaging(s) or alternatively in an overpack with one or more complete packages marked in accordance with 6.3.3. Interior supports shall be provided to secure secondary packaging(s) or packages in position after the ice or dry ice has dissipated. If ice is used, the outer packaging or overpack shall be leakproof. If dry ice is used, the outer packaging or overpack shall permit the release of carbon dioxide gas. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used;
   (c) Substances consigned in liquid nitrogen: Plastics primary receptacles capable of withstanding very low temperature shall be used. The secondary packaging shall also be capable of withstanding very low temperatures, and in most cases will need to be fitted over the primary receptacle individually. Provisions for the consignment of liquid nitrogen shall also be fulfilled. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the liquid nitrogen.
   (d) Lyophilised substances may also be carried in primary receptacles that are flame-sealed glass ampoules or rubber-stoppered glass vials fitted with metal seals.
3. Whatever the intended temperature of the consignment, the primary receptacle or the secondary packaging shall be capable of withstanding without leakage an internal pressure producing a pressure differential of not less than 95 kPa and temperatures in the range - 40 °C to + 55 °C.
4. Alternative packagings for the carriage of animal material may be authorized by the competent authority of the country of origin[(a)] in accordance with the provisions of 4.1.8.7.

[(a)] If the country of origin is not a COTIF Member State, the competent authority of the first COTIF Member State reached by the consignment.

P 621	PACKING INSTRUCTION	P 621

This instruction applies to UN No. 3291.

The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met:

(1) Rigid, leakproof packagings meeting the requirements of Chapter 6.1 for solids, at the packing group II performance level, provided there is sufficient absorbent material to absorb the entire amount of liquid present and the packaging is capable of retaining liquids;

(2) For packages containing larger quantities of liquid, rigid packagings meeting the requirements of Chapter 6.1 at the packing group II performance level for liquids.

Additional requirement

1. Packagings intended to contain sharp objects such as broken glass and needles shall be resistant to puncture and retain liquids under the performance test conditions in Chapter 6.1.
2. The closure of packagings shall be so constructed that they are hermetically closed after filling and so designed that any subsequent opening is immediately evident.

P 650	PACKING INSTRUCTION	P 650

This packing instruction applies to UN No. 3373.

(1) The packaging shall be of good quality, strong enough to withstand the shocks and loadings normally encountered during carriage, including transhipment between wagons or containers and between wagons or containers and warehouses as well as any removal from a pallet or overpack for subsequent manual or mechanical handling. Packagings shall be constructed and closed to prevent any loss of contents that might be caused under normal conditions of carriage by vibration or by changes in temperature, humidity or pressure.

(2) The packaging shall consist of at least three components:

(a) a primary receptacle;

(b) a secondary packaging; and

(c) an outer packaging

of which either the secondary or the outer packaging shall be rigid.

(3) Primary receptacles shall be packed in secondary packagings in such a way that, under normal conditions of carriage, they cannot break, be punctured or leak their contents into the secondary packaging. Secondary packagings shall be secured in outer packagings with suitable cushioning material. Any leakage of the contents shall not compromise the integrity of the cushioning material or of the outer packaging.

(4) For carriage, the mark illustrated below shall be displayed on the external surface of the outer packaging on a background of a contrasting colour and shall be clearly visible and legible. The mark shall be in the form of a square set at an angle of 45° (diamond-shaped) with minimum dimensions of 50 mm by 50 mm; the width of the line shall be at least 2 mm and the letters and numbers shall be at least 6 mm high. The proper shipping name "BIOLOGICAL SUBSTANCE, CATEGORY B" in letters at least 6 mm high shall be marked on the outer packaging adjacent to the diamond-shaped mark.

(5) At least one surface of the outer packaging shall have a minimum dimension of 100 mm x 100 mm.

(6) The completed package shall be capable of successfully passing the drop test in 6.3.5.3 as specified in 6.3.5.2 at a height of 1.2 m. Following the appropriate drop sequence, there shall be no leakage from the primary receptacle(s) which shall remain protected by absorbent material, when required, in the secondary packaging.

(7) For liquid substances:

(a) The primary receptacle(s) shall be leakproof;

(b) The secondary packaging shall be leakproof;

(c) If multiple fragile primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated to prevent contact between them;

(d) Absorbent material shall be placed between the primary receptacle(s) and the secondary packaging. The absorbent material shall be in quantity sufficient to absorb the entire contents of the primary receptacle(s) so that any release of the liquid substance will not compromise the integrity of the cushioning material or of the outer packaging;

(e) The primary receptacle or the secondary packaging shall be capable of withstanding, without leakage, an internal pressure of 95 kPa (0.95 bar).

(8) For solid substances:

(a) The primary receptacle(s) shall be siftproof;

(b) The secondary packaging shall be siftproof;

(c) If multiple fragile primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated to prevent contact between them;

(d) If there is any doubt as to whether or not residual liquid may be present in the primary receptacle during carriage then a packaging suitable for liquids, including absorbent materials, shall be used.

(9) Refrigerated or frozen specimens: ice, dry ice and liquid nitrogen

(a) When dry ice or liquid nitrogen is used to keep specimens cold, all applicable requirements of RID shall be met. When used, ice or dry ice shall be placed outside the secondary packagings or in the outer packaging or an overpack. Interior supports shall be provided to secure the secondary packagings in the original position after the ice or dry ice has dissipated. If ice is used, the outside packaging or overpack shall be leakproof. If carbon dioxide, solid (dry ice) is used, the packaging shall be designed and constructed to permit the release of carbon dioxide gas to prevent a build-up of pressure that could rupture the packagings and the package (the outer packaging or the overpack) shall be marked "Carbon dioxide, solid" or "Dry ice".

NOTE: If dry ice is used, there are no requirements to be met (see 2.2.9.1.14). If liquid nitrogen is used, it is sufficient to comply with Chapter 3.3, special provision 593.

(b) The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.

(10) When packages are placed in an overpack, the package markings required by this packing instruction shall either be clearly visible or be reproduced on the outside of the overpack.

(11) Infectious substances assigned to UN No. 3373 which are packed, and packages which are marked in accordance with this packing instruction are not subject to any other requirement in RID.

(12) Clear instructions on filling and closing such packages shall be provided by packaging manufacturers and subsequent distributors to the consignor or to the person who prepares the package (e.g. patient) to enable the package to be correctly prepared for carriage.

(13) Other dangerous goods shall not be packed in the same packaging as Class 6.2 infectious substances unless they are necessary for maintaining the viability, stabilizing or preventing degradation or neutralizing the hazards of the infectious substances. A quantity of 30 ml or less of dangerous goods included in Classes 3, 8 or 9 may be packed in each primary receptacle containing infectious substances. When these small quantities of dangerous goods are packed with infectious substances in accordance with this packing instruction no other requirements of RID need be met.

(14) If any substance has leaked and has been spilled in a wagon or container, it may not be reused until after it has been thoroughly cleaned and, if necessary, disinfected or decontaminated. Any other goods and articles carried in the same wagon or container shall be examined for possible contamination.

Additional requirement

Alternative packagings for the carriage of animal material may be authorized by the competent authority of the country of origin[(a)] in accordance with the provisions of 4.1.8.7.

[(a)] If the country of origin is not a COTIF Member State, the competent authority of the first COTIF Member State reached by the consignment.

P 800	PACKING INSTRUCTION	P 800

This instruction applies to UN Nos. 2803 and 2809.

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

(1) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met; or

(2) Steel flasks or bottles with threaded closures with a capacity not exceeding 3 litres, or

(3) Combination packagings which conform to the following requirements:

(a) Inner packagings shall comprise glass, metal or rigid plastics intended to contain liquids with a maximum net mass of 15 kg each;

(b) The inner packagings shall be packed with sufficient cushioning material to prevent breakage;

(c) Either the inner packagings or the outer packagings shall have inner liners or bags of strong leakproof and puncture-resistant material impervious to the contents and completely surrounding the contents to prevent it from escaping from the package irrespective of its position or orientation;

(d) The following outer packagings and maximum net masses are authorized:

Outer packaging	Maximum net mass
Drums	
steel (1A2)	400 kg
metal other than steel or aluminium (1N2)	400 kg
plastics (1H2)	400 kg
plywood (1D)	400 kg
fibre (1G)	400 kg
Kisten	
steel (4A)	400 kg
natural wood (4C1)	250 kg
natural wood with sift-proof walls (4C2)	250 kg
plywood (4D)	250 kg
reconstituted wood (4F)	125 kg
fibreboard (4G)	125 kg
expanded plastics (4H1)	60 kg
solid plastics (4H2)	125 kg

Special packing provision

PP 41	For UN No. 2803, when it is necessary to carry gallium at low temperatures in order to maintain it in a completely solid state, the above packagings may be overpack ed in a strong, water-resistant outer packaging which contains dry ice or other means of refrigeration. If a refrigerant is used, all of the above materials used in the packaging of gallium shall be chemically and physically resistant to the refrigerant and shall have impact resistance at the low temperatures of the refrigerant employed. If dry ice is used, the outer packaging shall permit the release of carbon dioxide gas.

P 801	PACKING INSTRUCTION	P 801

This instruction applies to new and used batteries assigned to UN Nos. 2794, 2795 or 3028.

The following packagings are authorized, provided the general provisions of 4.1.1, except 4.1.1.3, and 4.1.3 are met:

(1) Rigid outer packagings;

(2) Wooden slatted crates;

(3) Pallets.

Additional requirements

1. Batteries shall be protected against short circuits.
2. Batteries stacked shall be adequately secured in tiers separated by a layer of non conductive material.
3. Battery terminals shall not support the weight of other superimposed elements.
4. Batteries shall be packaged or secured to prevent inadvertent movement. Any cushioning material used shall be inert.

P 801a	PACKING INSTRUCTION	P 801a

This instruction applies to used batteries of UN Nos. 2794, 2795, 2800 and 3028.

Stainless steel or solid plastics battery boxes of a capacity of up to 1 m^3 are authorized provided the following provisions are met::

(1) The battery boxes shall be resistant to the corrosive substances contained in the storage batteries;

(2) Under normal conditions of carriage, no corrosive substance shall leak from the battery boxes and no other substance (e.g. water) shall enter the battery boxes. No dangerous residues of corrosive substances contained in the storage batteries shall adhere to the outside of the battery boxes;

(3) The battery boxes shall not be loaded with storage batteries to a height greater than the height of their sides;

(4) No storage battery containing substances or other dangerous goods which may react dangerously with one another shall be placed in a battery box;

(5) The battery boxes shall be either:

(a) covered; or

(b) carried in closed or sheeted open wagons or in closed or covered containers.

P 802	PACKING INSTRUCTION	P 802

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

(1) Combination packagings

Outer packagings:	1A2, 1B2, 1N2, 1H2, 1D, 4A, 4B, 4C1, 4C2, 4D, 4F or 4H2;
maximum net mass:	75 kg;
Inner packagings:	glass or plastics; maximum capacity: 10 litres;

(2) Combination packagings

Outer packagings:	1A2, 1B2, 1N2, 1H2, 1D, 1G, 4A, 4B, 4C1, 4C2, 4D, 4F, 4G or 4H2;
maximum net mass:	125 kg;
Inner packagings:	metal; maximum capacity: 40 litres;

(3) Composite packagings: Glass receptacle with outer steel, aluminium, plywood or solid plastics drum (6PA1, 6PB1, 6PD1, or 6PH2) or with outer steel or aluminium crate or box or with outer wooden box or with outer wickerwork hamper (6PA2, 6PB2, 6PC or 6PD2); maximum capacity: 60 litres;

(4) Steel drums (1A1) with a maximum capacity of 250 litres;

(5) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met.

P 803	PACKING INSTRUCTION	P 803

This instruction applies to UN No. 2028.

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

(1) Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);

(2) Boxes (4A, 4B, 4C1, 4C2, 4D, 4F, 4G, 4H2).

Maximum net mass: 75 kg.

The articles shall be individually packaged and separated from each other using partitions, dividers, inner packagings or cushioning material to prevent inadvertent discharge during normal conditions of carriage.

P 804	PACKING INSTRUCTION	P 804

This instruction applies to UN No. 1744.

The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met and the packagings are hermetically sealed:

(1) Combination packagings with a maximum gross mass of 25 kg, consisting of

– one or more glass inner packaging(s) with a maximum capacity of 1.3 litres each and filled to not more than 90% of their capacity; the closure(s) of which shall be physically held in place by any means capable of preventing back-off or loosening by impact or vibration during carriage, individually placed in

– metal or rigid plastics receptacles together with cushioning and absorbent material sufficient to absorb the entire contents of the glass inner packaging(s), further packed in

– 1A2, 1B2, 1N2, 1H2, 1D, 1G, 4A, 4B, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings.

(2) Combination packagings consisting of metal or polyvinylidene fluoride (PVDF) inner packagings, not exceeding 5 litres in capacity individually packed with absorbent material sufficient to absorb the contents and inert cushioning material in 1A2, 1B2, 1N2, 1H2, 1D, 1G, 4A, 4B, 4C1, 4C2, 4D, 4F, 4G or 4H2 outer packagings with a maximum gross mass of 75 kg. Inner packagings shall not be filled to more than 90% of their capacity. The closure of each inner packaging shall be physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during carriage;

(3) Packagings consisting of:

Outer packagings:

Steel or plastic drums, removable head (1A2 or 1H2) tested in accordance with the test requirements in 6.1.5 at a mass corresponding to the mass of the assembled package either as a packaging intended to contain inner packagings, or as a single packaging intended to contain solids or liquids, and marked accordingly;

Inner packagings:

Drums and composite packagings (1A1, 1B1, 1N1, 1H1 or 6HA1) meeting the requirements of Chapter 6.1 for single packagings, subject to the following conditions:

(a) The hydraulic pressure test shall be conducted at a pressure of at least 300 kPa (3 bar) (gauge pressure);

(b) The design and production leakproofness tests shall be conducted at a test pressure of 30 kPa (0.3 bar);

(c) They shall be isolated from the outer drum by the use of inert shock-mitigating cushioning material which surrounds the inner packaging on all sides;

(d) Their capacity shall not exceed 125 litres;

(e) Closures shall be of a screw type that are:

(i) Physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during carriage;

(ii) Provided with a cap seal;

(f) The outer and inner packagings shall be subjected periodically to an internal inspection and leakproofness test according to (b) at intervals of not more than two and a half years; and

(g) The outer and inner packagings shall bear in clearly legible and durable characters:

(i) the date (month, year) of the initial test and the latest periodic test and inspection of the inner packaging; and

(ii) the name or authorized symbol of the expert who carried out the tests and inspections;

(4) Pressure receptacles, provided that the general provisions of 4.1.3.6 are met.

(a) They shall be subjected to an initial test and periodic tests every 10 years at a pressure of not less than 1 MPa (10 bar) (gauge pressure);

(b) They shall be subjected periodically to an internal inspection and leakproofness test at intervals of not more than two and a half years;

(c) They may not be equipped with any pressure relief device;

(d) Each pressure receptacle shall be closed with a plug or valve(s) fitted with a secondary closure device; and

(e) The materials of construction for the pressure receptacle, valves, plugs, outlet caps, luting and gaskets shall be compatible with each other and with the contents.

P 900	PACKING INSTRUCTION	P 900
(Reserved)		

P 901	PACKING INSTRUCTION	P 901
This instruction applies to UN No. 3316.		
The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met: Packagings conforming to the performance level consistent with the packing group assigned to the kit as a whole (see 3.3.1, special provision 251). Maximum quantity of dangerous goods per outer packaging: 10 kg.		
Additional requirement Dangerous goods in kits shall be packed in inner packagings which shall not exceed either 250 ml or 250 g and shall be protected from other materials in the kit.		

P 902	PACKING INSTRUCTION	P 902
This instruction applies to UN No. 3268.		
The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met: Packagings conforming to the packing group III performance level. The packagings shall be designed and constructed to prevent movement of the articles and inadvertent operation during normal conditions of carriage. The articles may also be carried unpackaged in dedicated handling devices, wagons or containers when moved from where they are manufactured to an assembly plant.		
Additional requirement Any pressure vessel shall be in accordance with the requirements of the competent authority for the substance(s) contained in the pressure vessel(s).		

P 903	PACKING INSTRUCTION	P 903
This instruction applies to UN Nos. 3090, 3091, 3480 and 3481.		
The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met: Packagings conforming to the packing group II performance level. When cells and batteries are packed with equipment, they shall be packed in inner fibreboard packagings that meet the requirements for packing group II. When cells and batteries included in Class 9 are contained in equipment, the equipment shall be packed in strong outer packagings in such a manner as to prevent accidental operation during carriage. In addition, batteries with a strong, impact resistant outer casing of a gross mass of 12 kg or more, and assemblies of such batteries, may be packed in strong outer packagings, in protective enclosures (e.g., in fully enclosed or wooden slatted crates) unpackaged or on pallets. Batteries shall be secured to prevent inadvertent movement, and the terminals shall not support the weight of other superimposed elements.		
Additional requirement Batteries shall be protected against short circuit.		

P 903a	PACKING INSTRUCTION	P 903a

This instruction applies to used cells and batteries of UN Nos. 3090, 3091, 3480 and 3481.

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

Packagings conforming to the packing group II performance level.

Non-approved packagings shall, however, be permitted provided that:

– they meet the general provisions of 4.1.1, except 4.1.1.3, and 4.1.3;
– the cells and batteries are packed and stowed so as to prevent any risk of short circuits;
– the packages weigh not more than 30 kg.

Additional requirement

Batteries shall be protected against short circuit.

P 903b	PACKING INSTRUCTION	P 903b

This instruction applies to used cells and batteries of UN Nos. 3090, 3091, 3480 and 3481.

Used lithium cells and batteries with a gross mass of not more than 500 g each, collected for disposal, may be carried together with other used non-lithium batteries or alone without being individually protected, under the following conditions:

(1) In 1H2 drums or 4H2 boxes conforming to the packing group II performance level for solids;

(2) In 1A2 drums or 4A boxes fitted with a polyethylene bag and conforming to the packing group II performance level for solids. The polyethylene bag

– shall have an impact resistance of at least 480 grams in both parallel and perpendicular planes with respect to the length of the bag;
– shall have a minimum of 500 microns of thickness with an electrical resistivity of more than 10 Mohms and a water absorption rate over 24 hours at 25 °C lower than 0.01%;
– shall be closed and
– may only be used once;

(3) In collecting trays with a gross mass of less than 30 kg made from non-conducting material meeting the general conditions of 4.1.1.1, 4.1.1.2 and 4.1.1.5 to 4.1.1.8.

Additional requirements

The empty space in the packaging shall be filled with cushioning material. The cushioning material may be dispensed with when the packaging is entirely fitted with a polyethylene bag and the bag is closed.

Hermetically sealed packagings shall be fitted with a venting device according to 4.1.1.8. The venting device shall be so designed that an overpressure caused by gases does not exceed 10 kPa.

P 904	PACKING INSTRUCTION	P 904

This instruction applies to UN No. 3245.

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

(1) Packagings according to packing instruction P001 or P002 conforming to the packing group III performance level;

(2) Packagings, which need not conform to the packaging test requirements of Part 6, but conforming to the following:

(a) An inner packaging comprising:

(i) a watertight primary receptacle(s);

(ii) a watertight secondary packaging which is leakproof;

(iii) absorbent material placed between the primary receptacle(s) and the secondary packaging. The absorbent material shall be in a quantity sufficient to absorb the entire contents of the primary receptacle(s) so that any release of the liquid substance will not compromise the integrity of the cushioning material or of the outer packaging;

(iv) if multiple fragile primary receptacles are placed in a single secondary packaging they shall be individually wrapped or separated to prevent contact between them;

(b) An outer packaging shall be strong enough for its capacity, mass and intended use and with a smallest external dimension of at least 100 mm.

Additional requirements

Dry ice and liquid nitrogen

When carbon dioxide, solid, (dry ice) is used as a refrigerant, the packaging shall be designed and constructed to permit the release of the gaseous carbon dioxide to prevent the build up of pressure that could rupture the packaging.

Substances consigned in liquid nitrogen or dry ice shall be packed in primary receptacles that are capable of withstanding very low temperatures. The secondary packaging shall also be capable of withstanding very low temperatures and, in most cases, will need to be fitted over the primary receptacle individually.

P 905	PACKING INSTRUCTION	P 905

This instruction applies to UN Nos. 2990 and 3072.

Any suitable packaging is authorized, provided the general provisions of 4.1.1 and 4.1.3 are met, except that packagings need not conform to the requirements of Part 6.

When the life saving appliances are constructed to incorporate or are contained in rigid outer weatherproof casings (such as for lifeboats), they may be carried unpackaged.

Additional requirements

1. All dangerous substances and articles contained as equipment within the appliances shall be secured to prevent inadvertent movement and in addition:
   (a) Signal devices of Class 1 shall be packed in plastics or fibreboard inner packagings;
   (b) Non-flammable, non-toxic gases shall be contained in cylinders as specified by the competent authority, which may be connected to the appliance;
   (c) Electric storage batteries (Class 8) and lithium batteries (Class 9) shall be disconnected or electrically isolated and secured to prevent any spillage of liquid; and
   (d) Small quantities of other dangerous substances (for example in Classes 3, 4.1 and 5.2) shall be packed in strong inner packagings.
2. Preparation for transport and packaging shall include provisions to prevent any accidental inflation of the appliance.

P 906	PACKING INSTRUCTION	P 906

This instruction applies to UN Nos. 2315, 3151, 3152 and 3432.

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

(1) For liquids and solids containing or contaminated with PCBs or polyhalogenated biphenyls or terphenyls:

Packagings in accordance with P001 or P002, as appropriate;

(2) For transformers and condensers and other devices:

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

Notwithstanding the above, liquids and solids not packaged in accordance with P001 and P002 and unpackaged transformers and condensers may be carried in cargo transport units fitted with a leakproof metal tray to a height of at least 800 mm, containing sufficient inert absorbent material to absorb at least 1.1 times the volume of any free liquid.

Additional requirement

Adequate provisions shall be taken to seal the transformers and condensers to prevent leakage during normal conditions of carriage.

R 001	PACKING INSTRUCTION			R 001
The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met:				
Light gauge metal packagings	**Maximum capacity / maximum net mass**			
	Packing group I	**Packing group II**	**Packing group III**	
steel, non-removable head (0A1) steel, removable head (0A2)[(a)]	Not allowed Not allowed	40 l / 50 kg 40 l / 50 kg	40 l / 50 kg 40 l / 50 kg	
[(a)] Not allowed for UN No. 1261 Nitromethane				
NOTE 1: This instruction applies to solids and liquids (provided the design type is tested and marked appropriately). **2**: For Class 3, packing group II, these packagings may be used only for substances with no subsidiary risk and a vapour pressure of not more than 110 kPa at 50 °C and for slightly toxic pesticides.				

4.1.4.2 Packing instructions concerning the use of IBCs

IBC 01	PACKING INSTRUCTION	IBC 01
The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met: Metal (31A, 31B and 31N).		
Special packing provision specific to RID and ADR		
BB 1	For UN No. 3130, the openings of receptacles for this substance shall be tightly closed by means of two devices in series, one of which shall be screwed or secured in an equivalent manner.	

IBC 02	PACKING INSTRUCTION	IBC 02
The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met: (1) Metal (31A, 31B and 31N); (2) Rigid plastics (31H1 and 31H2); (3) Composite (31HZ1).		
Special packing provisions		
B 5	For UN Nos. 1791, 2014, 2984 and 3149, IBCs shall be provided with a device to allow venting during carriage. The inlet to the venting device shall be sited in the vapour space of the IBC under maximum filling conditions during carriage.	
B 7	For UN Nos. 1222 and 1865, IBCs with a capacity greater than 450 litres are not permitted due to the substance's potential for explosion when carried in large volumes.	
B 8	The pure form of this substance shall not be transported in IBCs since it is known to have a vapour pressure of more than 110 kPa at 50 °C or 130 kPa at 55 °C.	
B 15	For UN No. 2031 with more than 55% nitric acid, the permitted use of rigid plastics IBCs and of composite IBCs with a rigid plastics inner receptacle shall be two years from their date of manufacture.	
Special packing provision specific to RID and ADR		
BB 2	For UN No.1203, notwithstanding special provision 534 (see 3.3.1), IBCs shall only be used when the actual vapour pressure is not more than 110 kPa at 50 °C, or 130 kPa at 55 °C.	

IBC 03	PACKING INSTRUCTION	IBC 03
The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met: (1) Metal (31A, 31B and 31N); (2) Rigid plastics (31H1 and 31H2); (3) Composite (31HZ1, 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2).		
Special packing provision		
B 8	The pure form of this substance shall not be carried in IBCs since it is known to have a vapour pressure of more than 110 kPa at 50 °C or 130 kPa at 55 °C.	

IBC 04	PACKING INSTRUCTION	IBC 04
The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met: Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N).		

IBC 05	PACKING INSTRUCTION	IBC 05

The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met:

(1) Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N);

(2) Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2);

(3) Composite (11HZ1, 21HZ1 and 31HZ1).

IBC 06	PACKING INSTRUCTION	IBC 06

The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met:

(1) Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N);

(2) Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2);

(3) Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2).

Additional requirement

Composite IBCs 11HZ2 and 21HZ2 shall not be used when the substances being carried may become liquid during carriage.

Special packing provisions

B 12	For UN No. 2907, IBCs shall meet the packing group II performance level. IBCs meeting the test criteria of packing group I shall not be used.

IBC 07	PACKING INSTRUCTION	IBC 07

The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met:

(1) Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N);

(2) Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2);

(3) Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2);

(4) Wooden (11C, 11D and 11F).

Additional requirement

Liners of wooden IBCs shall be sift-proof.

IBC 08	PACKING INSTRUCTION	IBC 08

The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met:

(1) Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N);

(2) Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2);

(3) Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2);

(4) Fibreboard (11G);

(5) Wooden (11C, 11D and 11F);

(6) Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2).

Special packing provisions

B 3	Flexible IBCs shall be sift-proof and water-resistant or shall be fitted with a sift-proof and water-restistant liner.
B 4	Flexible, fibreboard or wooden IBCs shall be sift-proof and water-resistant or shall be fitted with a sift-proof and water-resistant liner.
B 6	For UN Nos. 1363, 1364, 1365, 1386, 1408, 1841, 2211, 2217, 2793 and 3314, IBCs are not required to meet the IBC testing requirements of Chapter 6.5.
B 13	**NOTE:** For UN Nos. 1748, 2208 and 2880, carriage by sea in IBCs is prohibited according to the IMDG Code.

IBC 99	PACKING INSTRUCTION	IBC 99

Only IBCs which are approved for these goods by the competent authority may be used. A copy of the competent authority approval shall accompany each consignment or the transport document shall include an indication that the packaging was approved by the competent authority.

IBC 100	PACKING INSTRUCTION	IBC 100

This instruction applies to UN Nos. 0082, 0241, 0331 and 0332.

The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 and special provisions of 4.1.5 are met:

(1) Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N);

(2) Flexible (13H2, 13H3, 13H4, 13L2, 13L3, 13L4 and 13M2);

(3) Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2);

(4) Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2).

Additional requirements

1. IBCs shall only be used for free flowing substances.
2. Flexible IBCs shall only be used for solids.

Special packing provisions

B 9	For UN No. 0082, this packing instruction may only be used when the substances are mixtures of ammonium nitrate or other inorganic nitrates with other combustible substances which are not explosive ingredients. Such explosives shall not contain nitroglycerin, similar liquid organic nitrates, or chlorates. Metal IBCs are not authorized.
B 10	For UN No. 0241, this packing instruction may only be used for substances which consist of water as an essential ingredient and high proportions of ammonium nitrate or other oxidizing substances some or all of which are in solution. The other constituents may include hydrocarbons or aluminium powder, but shall not include nitro-derivatives such as trinitrotoluene. Metal IBCs are not authorized.

IBC 520	PACKING INSTRUCTION	IBC 520

This instruction applies to organic peroxides and self-reactive substances of type F.

The IBCs listed below are authorized for the formulations listed, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 and special provisions of 4.1.7.2 are met.

For formulations not listed below, only IBCs which are approved by the competent authority may be used (see 4.1.7.2.2).

UN No.	Organic peroxide	Type of IBC	Maximum quantity (litres/kg)
3109	**ORGANIC PEROXIDE, TYPE F, LIQUID**		
	tert-BUTYL HYDROPEROXIDE, not more than 72% with water	31A	1250
	tert-BUTYL PEROXYACETATE, not more than 32% in diluent type A	31A 31HA1	1250 1000
	tert-BUTYL PEROXYBENZOATE, not more than 32% in diluent type A	31A	1250
	tert-BUTYL PEROXY-3,5,5-TRIMETHYLHEXANOATE, not more than 37% in diluent type A	31A 31HA1	1250 1000
	CUMYL HYDROPEROXIDE, not more than 90% in diluent type A	31HA1	1250
	DIBENZOYL PEROXIDE, not more than 42% as a stable dispersion in water	31H1	1000
	DI-tert-BUTYL PEROXIDE, not more than 52% in diluent type A	31A 31HA1	1250 1000
	1,1-DI-(tert-BUTYLPEROXY)CYCLOHEXANE, not more than 37% in diluent type A	31A	1250
	1,1-DI-(tert-BUTYLPEROXY)CYCLOHEXANE, not more than 42% in diluent type A	31H1	1000
	DILAUROYL PEROXIDE, not more than 42%, stable dispersion, in water	31HA1	1000
	ISOPROPYL CUMYL HYDROPEROXIDE, not more than 72% in diluent type A	31HA1	1250
	p-MENTHYL HYDROPEROXIDE, not more than 72% in diluent type A	31HA1	1250
	PEROXYACETIC ACID, STABILIZED, not more than 17%	31H1 31HA1 31A	1500 1500 1500
3110	**ORGANIC PEROXIDE, TYPE F, SOLID**		
	DICUMYL PEROXIDE	31A 31H1 31HA1	2000

Additional requirements

1. IBCs shall be provided with a device to allow venting during carriage. The inlet to the pressure-relief device shall be sited in the vapour space of the IBC under maximum filling conditions during carriage.
2. To prevent explosive rupture of metal IBCs or composite IBCs with complete metal casing, the emergency-relief devices shall be designed to vent all the decomposition products and vapours evolved during self-accelerating decomposition or during a period of not less than one hour of fire-engulfment as calculated by the formula in 4.2.1.13.8 or in special provision TE 12 of 6.8.4.

IBC 620	PACKING INSTRUCTION	IBC 620

This instruction applies to UN No. 3291.

The following IBCs are authorized, provided the general provisions of 4.1.1, 4.1.2 and 4.1.3 are met:

Rigid, leakproof IBCs conforming to the packing group II performance level.

Additional requirements

1. There shall be sufficient absorbent material to absorb the entire amount of liquid present in the IBC.
2. IBCs shall be capable of retaining liquids.
3. IBCs intended to contain sharp objects such as broken glass and needles shall be resistant to puncture.

4.1.4.3 Packing instructions concerning the use of large packagings

LP 01	PACKING INSTRUCTION (LIQUIDS)			LP 01
The following large packagings are authorized provided the general provision of 4.1.1 and 4.1.3 are met:				
Inner packagings	**Large outer packagings**	**Packing group I**	**Packing group II**	**Packing group III**
Glass 10 litre Plastics 30 litre Metal 40 litre	Steel (50A) Aluminium (50B) Metal other than steel or aluminium (50N) Rigid plastics (50H) Natural wood (50C) Plywood (50D) Reconstituted wood (50F) Fibreboard (50G)	Not allowed	Not allowed	Maximum capacity: 3 m^3

LP 02	PACKING INSTRUCTION (SOLIDS)			LP 02
The following large packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met:				
Inner packagings	**Large outer packagings**	**Packing group I**	**Packing group II**	**Packing group III**
Glass 10 kg Plastics[(b)] 50 kg Metal 50 kg Paper[(a),(b)] 50 kg Fibre[(a),(b)] 50 kg	Steel (50A) Aluminium (50B) Metal other than steel or aluminium (50N) Rigid plastics (50H) Natural wood (50C) Plywood (50D) Reconstituted wood (50F) Fibreboard (50G) Flexible plastics (51H)[(c)]	Not allowed	Not allowed	Maximum capacity: 3 m^3
[(a)] These inner packagings shall not be used when the substances being carried may become liquid during carriage. [(b)] These inner packagings shall be sift-proof. [(c)] To be used with flexible inner packagings only.				
Special packing provision				
L 2	For UN 1950 aerosols, the large packaging shall meet the packing group III performance level. Large packagings for waste aerosols carried in accordance with special provision 327 shall have in addition a means of retaining any free liquid that might escape during carriage e.g. absorbent material.			

LP 99	PACKING INSTRUCTION	LP 99
Only large packagings which are approved for these goods by the competent authority may be used. A copy of the competent authority approval shall accompany each consignment or the transport document shall include an indication that the packaging was approved by the competent authority.		

LP 101	PACKING INSTRUCTION	LP 101
The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 and special provisions of 4.1.5 are met:		
Inner packagings	**Intermediate packagings**	**Large packagings**
Not necessary	Not necessary	Steel (50A) Aluminium (50B) Metal other than steel or aluminium (50N) Rigid plastics (50H) Natural wood (50C) Plywood (50D) Reconstituted wood (50F) Fibreboard (50G)
Special packing provision		
L 1	For UN Nos. 0006, 0009, 0010, 0015, 0016, 0018, 0019, 0034, 0035, 0038, 0039, 0048, 0056, 0137, 0138, 0168, 0169, 0171, 0181, 0182, 0183, 0186, 0221, 0243, 0244, 0245, 0246, 0254, 0280, 0281, 0286, 0287, 0297, 0299, 0300, 0301, 0303, 0321, 0328, 0329, 0344, 0345, 0346, 0347, 0362, 0363, 0370, 0412, 0424, 0425, 0434, 0435, 0436, 0437, 0438, 0451, 0488 and 0502: Large and robust explosives articles, normally intended for military use, without their means of initiation or with their means of initiation containing at least two effective protective features, may be carried unpackaged. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of carriage. A negative result in Test Series 4 on an unpackaged article indicates that the article can be considered for carriage unpackaged. Such unpackaged articles may be fixed to cradles or contained in crates or other suitable handling devices.	

LP 102	PACKING INSTRUCTION	LP 102
The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 and special provisions of 4.1.5 are met:		
Inner packagings	**Intermediate packagings**	**Large packagings**
Bags water resistant **Receptacles** fibreboard metal plastics wood **Sheets** fibreboard, corrugated **Tubes** fibreboard	Not necessary	Steel (50A) Aluminium (50B) Metal other than steel or aluminium (50N) Rigid plastics (50H) Natural wood (50C) Plywood (50D) Reconstituted wood (50F) Fibreboard (50G)

LP 621	PACKING INSTRUCTION	LP 621

This instruction applies to UN No. 3291.

The following large packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

(1) For clinical waste placed in inner packagings: Rigid, leakproof large packagings conforming to the requirements of Chapter 6.6 for solids, at the packing group II performance level, provided there is sufficient absorbent material to absorb the entire amount of liquid present and the large packaging is capable of retaining liquids;

(2) For packages containing larger quantities of liquid: Large rigid packagings conforming to the requirements of Chapter 6.6, at the packing group II performance level, for liquids.

Additional requirement

Large packagings intended to contain sharp objects such as broken glass and needles shall be resistant to puncture and retain liquids under the performance test conditions in Chapter 6.6.

LP 902	PACKING INSTRUCTION	LP 902

This instruction applies to UN No. 3268.

The following packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:

Packagings conforming to the packing group III performance level. The packagings shall be designed and constructed to prevent movement of the articles and inadvertent operation during normal conditions of carriage.

The articles may also be carried unpackaged in dedicated handling devices, wagons or containers when moved from where they are manufactured to an assembly plant.

Additional requirement

Any pressure vessel shall be in accordance with the requirements of the competent authority for the substance(s) contained in the pressure vessel(s).

4.1.4.4 (Deleted)

4.1.5 Special packing provisions for goods of Class 1

4.1.5.1 The general provisions of Section 4.1.1 shall be met.

4.1.5.2 All packagings for Class 1 goods shall be so designed and constructed that:

(a) They will protect the explosives, prevent them escaping and cause no increase in the risk of unintended ignition or initiation when subjected to normal conditions of carriage including foreseeable changes in temperature, humidity and pressure;

(b) The complete package can be handled safely in normal conditions of carriage; and

(c) The packages will withstand any loading imposed on them by foreseeable stacking to which they will be subject during carriage so that they do not add to the risk presented by the explosives, the containment function of the packagings is not harmed, and they are not distorted in a way or to an extent which will reduce their strength or cause instability of a stack.

4.1.5.3 All explosive substances and articles, as prepared for carriage, shall have been classified in accordance with the procedures detailed in 2.2.1.

4.1.5.4 Class 1 goods shall be packed in accordance with the appropriate packing instruction shown in Column (8) of Table A of Chapter 3.2, as detailed in 4.1.4.

4.1.5.5 Packagings, including IBCs and large packagings shall conform to the requirements of Chapter 6.1, 6.5 or 6.6, respectively, and shall meet the test requirements of 6.1.5, 6.5.6 or 6.6.5, respectively, for packing group II, subject to 4.1.1.13, 6.1.2.4 and 6.5.1.4.4. Packagings other than metal packagings meeting the test criteria of packing group I may be used. To avoid unnecessary confinement, metal packagings of packing group I shall not be used.

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

4.1.5.7 The closure device of metal drums shall include a suitable gasket; if a closure device includes a screw-thread, the ingress of explosive substances into the screw-thread shall be prevented.

4.1.5.8 Packagings for water soluble substances shall be water resistant. Packagings for desensitized or phlegmatized substances shall be closed to prevent changes in concentration during carriage.

4.1.5.9 (Reserved)

4.1.5.10 Nails, staples and other closure devices made of metal without protective covering shall not penetrate to the inside of the outer packaging unless the inner packaging adequately protects the explosives against contact with the metal.

4.1.5.11 Inner packagings, fittings and cushioning materials and the placing of explosive substances or articles in packages shall be accomplished in a manner which prevents the explosive substances or articles from becoming loose in the outer packaging under normal conditions of carriage. Metallic components of articles shall be prevented from making contact with metal packagings. Articles containing explosive substances not enclosed in an outer casing shall be separated from each other in order to prevent friction and impact. Padding, trays, partitioning in the inner or outer packaging, mouldings or receptacles may be used for this purpose.

4.1.5.12 Packagings shall be made of materials compatible with, and impermeable to, the explosives contained in the package, so that neither interaction between the explosives and the packaging materials, nor leakage, causes the explosive to become unsafe to carriage, or the hazard division or compatibility group to change.

4.1.5.13 The ingress of explosive substances into the recesses of seamed metal packagings shall be prevented.

4.1.5.14 Plastics packagings shall not be liable to generate or accumulate sufficient static electricity so that a discharge could cause the packaged explosive substances or articles to initiate, ignite or function.

4.1.5.15 Large and robust explosives articles, normally intended for military use, without their means of initiation or with their means of initiation containing at least two effective protective features, may be carried unpackaged. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of carriage. A negative result in Test Series 4 on an unpackaged article indicates that the article can be considered for carriage unpackaged. Such unpackaged articles may be fixed to cradles or contained in crates or other suitable handling, storage or launching devices in such a way that they will not become loose during normal conditions of carriage.

Where such large explosive articles are as part of their operational safety and suitability tests subjected to test regimes that meet the intentions of RID and such tests have been successfully undertaken, the competent authority may approve such articles to be carried in accordance with RID.

4.1.5.16 Explosive substances shall not be packed in inner or outer packagings where the differences in internal and external pressures, due to thermal or other effects, could cause an explosion or rupture of the package.

4.1.5.17 Whenever loose explosive substances or the explosive substance of an uncased or partly cased article may come into contact with the inner surface of metal packagings (1A2, 1B2, 4A, 4B and metal receptacles), the metal packaging shall be provided with an inner liner or coating (see 4.1.1.2).

4.1.5.18 Packing instruction P101 may be used for any explosive provided the packaging has been approved by a competent authority regardless of whether the packaging complies with the packing instruction assignment in Column (8) of Table A of Chapter 3.2.

4.1.6 Special packing provisions for goods of Class 2 and goods of other classes assigned to packing instruction P200

4.1.6.1 This section provides general requirements applicable to the use of pressure receptacles and open cryogenic receptacles for the carriage of Class 2 substances and goods of other classes assigned to packing instruction P200 (e.g. UN 1051 hydrogen cyanide, stabilized). Pressure receptacles shall be constructed and closed so as to prevent any loss of contents which might be caused under normal conditions of carriage, including by vibration, or by changes in temperature, humidity or pressure (resulting from change in altitude, for example).

4.1.6.2 Parts of pressure receptacles and open cryogenic receptacles which are in direct contact with dangerous goods shall not be affected or weakened by those dangerous goods and shall not cause a dangerous effect (e.g. catalysing a reaction or reacting with the dangerous goods).

4.1.6.3 Pressure receptacles, including their closures and open cryogenic receptacles, shall be selected to contain a gas or a mixture of gases according to the requirements of 6.2.1.2 and the requirements of the relevant packing instructions of 4.1.4.1. This sub-section also applies to pressure receptacles which are elements of MEGCs and battery-wagons.

4.1.6.4 A change of use of a refillable pressure receptacle shall include emptying, purging and evacuation operations to the extent necessary for safe operation (see also table of standards at the end of this section). In addition, a pressure receptacle that previously contained a Class 8 corrosive substance or a substance of another class with a corrosive subsidiary risk shall not be authorized for the carriage of a Class 2 substance unless the necessary inspection and testing as specified in 6.2.1.6 and 6.2.3.5 respectively have been performed.

4.1.6.5 Prior to filling, the packer shall perform an inspection of the pressure receptacle or open cryogenic receptacle and ensure that the pressure receptacle or open cryogenic receptacle is authorized for the substance to be carried and that the requirements have been met. Shut-off valves shall be closed after filling and remain closed during carriage. The consignor shall verify that the closures and equipment are not leaking.

NOTE: Shut-off valves fitted to individual cylinders in bundles may be open during carriage, unless the substance carried is subject to special packing provision "k" or "q" in packing instruction P200.

4.1.6.6 Pressure receptacles and open cryogenic receptacles shall be filled according to the working pressures, filling ratios and provisions specified in the appropriate packing instruction for the specific substance being filled. Reactive gases and gas mixtures shall be filled to a pressure such that if complete decomposition of the gas occurs, the working pressure of the pressure receptacle shall not be exceeded. Bundles of cylinders shall not be filled in excess of the lowest working pressure of any given cylinder in the bundle.

4.1.6.7 Pressure receptacles, including their closures, shall conform to the design, construction, inspection and testing requirements detailed in Chapter 6.2. When outer packagings are prescribed, the pressure receptacles and open cryogenic receptacles shall be firmly secured therein. Unless otherwise specified in the detailed packing instructions, one or more inner packagings may be enclosed in one outer packaging.

4.1.6.8 Valves shall be designed and constructed in such a way that they are inherently able to withstand damage without release of the contents or shall be protected from damage which could cause inadvertent release of the contents of the pressure receptacle, by one of the following methods (see also table of standards at the end of this section):

(a) Valves are placed inside the neck of the pressure receptacle and protected by a threaded plug or cap;

(b) Valves are protected by caps. Caps shall possess vent-holes of sufficient cross-sectional area to evacuate the gas if leakage occurs at the valves;

(c) Valves are protected by shrouds or guards;

(d) Pressure receptacles are carried in frames, (e.g. cylinders in bundles); or

(e) Pressure receptacles are carried in protective boxes. For UN pressure receptacles the packaging as prepared for carriage shall be capable of meeting the drop test specified in 6.1.5.3 at the packing group I performance level.

4.1.6.9 Non-refillable pressure receptacles shall:

(a) be carried in an outer packaging, such as a box or crate, or in shrink-wrapped or stretch-wrapped trays;

(b) be of a water capacity less than or equal to 1.25 litres when filled with flammable or toxic gas;

(c) not be used for toxic gases with an LC_{50} less than or equal to 200 ml/m^3; and

(d) not be repaired after being put into service.

4.1.6.10 Refillable pressure receptacles shall be periodically inspected according to the provisions of 6.2.1.6 and 6.2.3.5 respectively and packing instruction P200 or P203 as applicable. Pressure receptacles shall not be filled after they become due for periodic inspection but may be carried after the expiry of the time-limit for purposes of performing inspection or disposal, including the intermediate carriage operations.

4.1.6.11 Repairs shall be consistent with the fabrication and testing requirements of the applicable design and construction standards and are only permitted as indicated in the relevant periodic inspection standards specified in Chapter 6.2. Pressure receptacles, other than the jacket of closed cryogenic receptacles, shall not be subjected to repairs of any of the following:

(a) weld cracks or other weld defects;

(b) cracks in walls;

(c) leaks or defects in the material of the wall, head or bottom.

4.1.6.12 Pressure receptacles shall not be offered for filling:

(a) when damaged to such an extent that the integrity of the pressure receptacle or its service equipment may be affected;

(b) unless the pressure receptacle and its service equipment has been examined and found to be in good working order; and

(c) unless the required certification, retest, and filling markings are legible.

4.1.6.13 Filled pressure receptacles shall not be offered for carriage:

(a) when leaking;

(b) when damaged to such an extent that the integrity of the pressure receptacle or its service equipment may be affected;

(c) unless the pressure receptacle and its service equipment has been examined and found to be in good working order; and

(d) unless the required certification, retest, and filling markings are legible.

4.1.6.14 For UN pressure receptacles, the ISO standards listed below shall be applied. For other pressure receptacles, the requirements of section 4.1.6 are considered to have been complied with if the following standards, as relevant, are applied:

Applicable paragraphs	**Reference**	**Document title**
4.1.6.2	ISO 11114-1:1997	Transportable gas cylinders – Compatibility of cylinder and valve materials with gas contents – Part 1: Metallic Materials
	ISO 11114-2:2000	Transportable gas cylinders – Compatibility of cylinder and valve materials with gas contents – Part 2: Non-metallic Materials
4.1.6.4	ISO 11621:2005	Gas cylinders – Procedures for change of gas service
4.1.6.8 Valves with inherent protection	Annex A of EN ISO 10297:2006	Gas cylinder – Refillable gas cylinder valves – Specification and type testing
	EN 13152:2001 + A1:2003	Testing and specifications of LPG cylinder valves – self closing
	EN 13153:2001 + A1:2003	Testing and specifications of LPG cylinder valves – manually operated
4.1.6.8 (b) and (c)	ISO 11117:1998	Gas Cylinders – Valve Protection caps and valve guards for industrial and medical gas cylinders – Design construction and tests
	EN 962:1996 + A2:2000	Valve protection caps and valve guards for industrial and medical gas cylinders – Design, construction and tests

4.1.7 Special packing provisions for organic peroxides of Class 5.2 and self-reactive substances of Class 4.1

4.1.7.0.1 For organic peroxides, all receptacles shall be "effectively closed". Where significant internal pressure may develop in a package by the evolution of a gas, a vent may be fitted, provided the gas emitted will not cause danger, otherwise the degree of filling shall be limited. Any venting device shall be so constructed that liquid will not escape when the package is in an upright position and it shall be able to prevent ingress of impurities. The outer packaging, if any, shall be so designed as not to interfere with the operation of the venting device.

4.1.7.1 Use of packagings

4.1.7.1.1 Packagings for organic peroxides and self-reactive substances shall meet the requirements of Chapter 6.1 or of Chapter 6.6 at the packing group II performance level. To avoid unnecessary confinement, metal packagings meeting the test criteria of packing group I shall not be used.

4.1.7.1.2 The packing methods for organic peroxides and self-reactive substances are listed in packing instruction 520 and are designated OP1 to OP8. The quantities specified for each packing method are the maximum quantities authorized per package.

4.1.7.1.3 The packing methods appropriate for the individual currently assigned organic peroxides and self-reactive substances are listed in 2.2.41.4 and 2.2.52.4.

4.1.7.1.4 For new organic peroxides, new self-reactive substances or new formulations of currently assigned organic peroxides or self-reactive substances, the following procedure shall be used to assign the appropriate packing method:

(a) ORGANIC PEROXIDE, TYPE B or SELF-REACTIVE SUBSTANCE, TYPE B:

Packing method OP5 shall be assigned, provided that the organic peroxide (or self-reactive substance) satisfies the criteria of 20.4.3 (b) (resp. 20.4.2 (b)) of the Manual of Tests and Criteria in a packaging authorized by the packing method. If the organic peroxide (or self-reactive substance) can only satisfy these criteria in a smaller packaging than those authorized by packing method OP5 (viz. one of the packagings listed for OP1 to OP4), then the corresponding packing method with the lower OP number is assigned;

(b) ORGANIC PEROXIDE, TYPE C or SELF-REACTIVE SUBSTANCE, TYPE C:

Packing method OP6 shall be assigned, provided that the organic peroxide (or self-reactive substance) satisfies the criteria of 20.4.3 (c) (resp. 20.4.2 (c)) of the Manual of Tests and Criteria in a packaging authorized by the packing method. If the organic peroxide (or self-reactive substance) can only satisfy these criteria in a smaller packaging than those authorized by packing method OP6 then the corresponding packing method with the lower OP number is assigned;

(c) ORGANIC PEROXIDE, TYPE D or SELF-REACTIVE SUBSTANCE, TYPE D:

Packing method OP7 shall be assigned to this type of organic peroxide or self-reactive substance;

(d) ORGANIC PEROXIDE, TYPE E or SELF-REACTIVE SUBSTANCE, TYPE E:

Packing method OP8 shall be assigned to this type of organic peroxide or self-reactive substance;

(e) ORGANIC PEROXIDE, TYPE F or SELF-REACTIVE SUBSTANCE, TYPE F:

Packing method OP8 shall be assigned to this type of organic peroxide or self-reactive substance.

4.1.7.2 Use of intermediate bulk containers

4.1.7.2.1 The currently assigned organic peroxides specifically listed in packing instruction IBC520 may be carried in IBCs in accordance with this packing instruction.

4.1.7.2.2 Other organic peroxides and self-reactive substances of type F may be carried in IBCs under conditions established by the competent authority of the country of origin when, on the basis of the appropriate tests, that competent authority is satisfied that such carriage may be safely conducted. The tests undertaken shall include those necessary:

(a) To prove that the organic peroxide (or self-reactive substance) complies with the principles for classification given in 20.4.3 (f) [resp. 20.4.2 (f)] of the Manual of Tests and Criteria, exit box F of Figure 20.1 (b) of the Manual;

(b) To prove the compatibility of all materials normally in contact with the substance during carriage;

(c) (Reserved)

(d) To design, when applicable, pressure and emergency relief devices; and

(e) To determine if any special provisions are necessary for safe carriage of the substance.

If the country of origin is not a COTIF Member State, the classification and transport conditions shall be recognized by the competent authority of the first COTIF Member State reached by the consignment.

4.1.7.2.3 Emergencies to be taken into account are self-accelerating decomposition and fire engulfment. To prevent explosive rupture of metal or composite IBCs with a complete metal casing, the emergency-relief devices shall be designed to vent all the decomposition products and vapours evolved during self-accelerating decomposition or during a period of not less than one hour of complete fire engulfment calculated by the equations given in 4.2.1.13.8.

4.1.8 Special packing provisions for infectious substances of Class 6.2

4.1.8.1 Consignors of infectious substances shall ensure that packages are prepared in such a manner that they arrive at their destination in good condition and present no hazard to persons or animals during carriage.

4.1.8.2 The definitions in 1.2.1 and the general requirements of 4.1.1.1 to 4.1.1.16, except 4.1.1.3, 4.1.1.9 to 4.1.1.12 and 4.1.1.15 apply to infectious substances packages. However, liquids shall only be filled into packagings which have an appropriate resistance to the internal pressure that may develop under normal conditions of carriage.

4.1.8.3 An itemized list of contents shall be enclosed between the secondary packaging and the outer packaging. When the infectious substances to be carried are unknown, but suspected of meeting the criteria for inclusion in Category A, the words "suspected Category A infectious substance" shall be shown, in parenthesis, following the proper shipping name on the document inside the outer packaging.

4.1.8.4 Before an empty packaging is returned to the consignor, or sent elsewhere, it shall be disinfected or sterilized to nullify any hazard and any label or marking indicating that it had contained an infectious substance shall be removed or obliterated.

4.1.8.5 Provided an equivalent level of performance is maintained, the following variations in the primary receptacles placed within a secondary packaging are allowed without the need for further testing of the completed packaging:

(a) Primary receptacles of equivalent or smaller size as compared to the tested primary receptacles may be used provided:

(i) the primary receptacles are of similar design to the primary receptacle tested (e.g. shape: round, rectangular, etc.);

(ii) the material of construction of the primary receptacles (e.g. glass, plastics, metal) offers resistance to impact and stacking forces equivalent to or better than that of the primary receptacles originally tested;

(iii) the primary receptacles have the same or smaller openings and the closure is of equivalent design (e.g. screw cap, friction lid, etc.);

(iv) sufficient additional cushioning material is used to take up empty spaces and to prevent significant movement of the primary receptacles; and

(v) primary receptacles are oriented within the secondary packagings in the same manner as in the tested package.

(b) A lesser number of the tested primary receptacles, or of the alternative types of primary receptacles identified in (a) above, may be used provided sufficient cushioning is added to fill the void space(s) and to prevent significant movement of the primary receptacles.

4.1.8.6 Paragraphs 4.1.8.1 to 4.1.8.5 only apply to infectious substances of Category A (UN Nos. 2814 and 2900). They do not apply to UN No. 3373 BIOLOGICAL SUBSTANCE, CATEGORY B (see packing instruction P650 of 4.1.4.1), nor to UN No. 3291 CLINICAL WASTE, UNSPECIFIED, N.O.S. or (BIO) MEDICAL WASTE, N.O.S. or REGULATED MEDICAL WASTE, N.O.S.

4.1.8.7 For the carriage of animal material, packagings or IBCs not specifically authorized in the applicable packing instruction shall not be used for the carriage of a substance or article unless specifically approved by the competent authority of the country of origin[3] and provided:

(a) The alternative packaging complies with the general requirements of this Part;

(b) When the packing instruction indicated in column (8) of Table A of Chapter 3.2 so specifies, the alternative packaging meets the requirements of Part 6;

(c) The competent authority of the country of origin[3] determines that the alternative packaging provides at least the same level of safety as if the substance were packed in accordance with a method specified in the particular packing instruction indicated in column (8) of Table A of Chapter 3.2; and

(d) A copy of the competent authority approval accompanies each consignment or the transport document includes an indication that alternative packaging was approved by the competent authority.

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[3] If the country of origin is not a COTIF Member State, the competent authority of the first COTIF Member State reached by the consignment.

4.1.9 Special packing provisions for Class 7

4.1.9.1 General

4.1.9.1.1 Radioactive material, packagings and packages shall meet the requirements of Chapter 6.4. The quantity of radioactive material in a package shall not exceed the limits specified in 2.2.7.2.2, 2.2.7.2.4.1, 2.2.7.2.4.4, 2.2.7.2.4.5, 2.2.7.2.4.6, special provision 336 of Chapter 3.3 and 4.1.9.3.

The types of packages for radioactive materials covered by RID, are:

(a) Excepted package (see 1.7.1.5);

(b) Industrial package Type 1 (Type IP-1 package);

(c) Industrial package Type 2 (Type IP-2 package);

(d) Industrial package Type 3 (Type IP-3 package);

(e) Type A package;

(f) Type B(U) package;

(g) Type B(M) package;

(h) Type C package.

Packages containing fissile material or uranium hexafluoride are subject to additional requirements.

4.1.9.1.2 The non-fixed contamination on the external surfaces of any package shall be kept as low as practicable and, under routine conditions of transport, shall not exceed the following limits:

(a) 4 Bq/cm^2 for beta and gamma emitters and low toxicity alpha emitters; and

(b) 0.4 Bq/cm^2 for all other alpha emitters.

These limits are applicable when averaged over any area of 300 cm^2 of any part of the surface.

4.1.9.1.3 A package, other than an excepted package, shall not contain any items other than those that are necessary for the use of the radioactive material. The interaction between these items and the package under the conditions of carriage applicable to the design, shall not reduce the safety of the package.

4.1.9.1.4 Except as provided in 7.5.11, CW33, the level of non-fixed contamination on the external and internal surfaces of overpacks, containers, tanks, IBCs and wagons shall not exceed the limits specified in 4.1.9.1.2.

4.1.9.1.5 Radioactive material with a subsidiary risk shall be carried in packagings, IBCs or tanks fully complying with the requirements of the relevant chapters of Part 6 as appropriate, as well as applicable requirements of Chapters 4.1, 4.2 or 4.3 for that subsidiary risk.

4.1.9.1.6 Before the first shipment of any package, the following requirements shall be fulfilled:

(a) If the design pressure of the containment system exceeds 35 kPa (gauge), it shall be ensured that the containment system of each package conforms to the approved design requirements relating to the capability of that system to maintain its integrity under that pressure;

(b) For each Type B(U), Type B(M) and Type C package and for each package containing fissile material, it shall be ensured that the effectiveness of its shielding and containment and, where necessary, the heat transfer characteristics and the effectiveness of the confinement system, are within the limits applicable to or specified for the approved design;

(c) For packages containing fissile material, where, in order to comply with the requirements of 6.4.11.1, neutron poisons are specifically included as components of the package, checks shall be performed to confirm the presence and distribution of those neutron poisons.

4.1.9.1.7 Before each shipment of any package, the following requirements shall be fulfilled:

(a) For any package it shall be ensured that all the requirements specified in the relevant provisions of RID have been satisfied;

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

(c) For each package requiring competent authority approval, it shall be ensured that all the requirements specified in the approval certificates have been satisfied;

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

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

(f) For each special form radioactive material, it shall be ensured that all the requirements specified in the approval certificate and the relevant provisions of RID have been satisfied;

(g) For packages containing fissile material the measurement specified in 6.4.11.4 (b) and the tests to demonstrate closure of each package as specified in 6.4.11.7 shall be performed where applicable;

(h) For each low dispersible radioactive material, it shall be ensured that all the requirements specified in the approval certificate and the relevant provisions of RID have been satisfied.

4.1.9.1.8 The consignor shall also have a copy of any instructions with regard to the proper closing of the package and any preparation for shipment before making any shipment under the terms of the certificates.

4.1.9.1.9 Except for consignments under exclusive use, the transport index of any package or overpack shall not exceed 10, nor shall the criticality safety index of any package or overpack exceed 50.

4.1.9.1.10 Except for packages or overpacks carried under exclusive use under the conditions specified in 7.5.11, CW 33 (3.5) (a), the maximum radiation level at any point on any external surface of a package or overpack shall not exceed 2 mSv/h.

4.1.9.1.11 The maximum radiation level at any point on any external surface of a package or overpack under exclusive use shall not exceed 10 mSv/h.

4.1.9.2 Requirements and controls for carriage of LSA material and SCO

4.1.9.2.1 The quantity of LSA material or SCO in a single Type IP-1 package, Type IP-2 package, Type IP-3 package, or object or collection of objects, whichever is appropriate, shall be so restricted that the external radiation level at 3 m from the unshielded material or object or collection of objects does not exceed 10 mSv/h.

4.1.9.2.2 For LSA material and SCO which is or contains fissile material the applicable requirements of 6.4.11.1 and 7.5.11 CW 33 (4.1) and (4.2) shall be met.

4.1.9.2.3 LSA material and SCO in groups LSA-I and SCO-I may be carried unpackaged under the following conditions:

(a) All unpackaged material other than ores containing only naturally occurring radionuclides shall be carried in such a manner that under routine conditions of carriage there will be no escape of the radioactive contents from the wagon nor will there be any loss of shielding;

(b) Each wagon shall be under exclusive use, except when only carrying SCO-I on which the contamination on the accessible and the inaccessible surfaces is not greater than ten times the corresponding level according to the definition of "contamination" in 2.2.7.1.2; and

(c) For SCO-I where it is suspected that non-fixed contamination exists on inaccessible surfaces in excess of the values specified in 2.2.7.2.3.2 (a) (i), measures shall be taken to ensure that the radioactive material is not released into the wagon.

4.1.9.2.4 LSA material and SCO, except as otherwise specified in 4.1.9.2.3, shall be packaged in accordance with the table below:

Industrial package requirements for LSA material and SCO

Radioactive contents	Industrial package type	
	Exclusive use	Not under exclusive use
LSA-I Solid[(a)] Liquid	 Type IP-1 Type IP-1	 Type IP-1 Type IP-2
LSA-II Solid Liquid and gas	 Type IP-2 Type IP-2	 Type IP-2 Type IP-3
LSA-III	Type IP-2	Type IP-3
SCO-I[(a)]	Type IP-1	Type IP-1
SCO-II	Type IP-2	Type IP-2

[(a)] Under the conditions specified in 4.1.9.2.3, LSA-I material and SCO-I may be carried unpackaged.

4.1.9.3 Packages containing fissile material

Unless not classified as fissile in accordance with 2.2.7.2.3.5, packages containing fissile material shall not contain:

(a) A mass of fissile material different from that authorized for the package design;

(b) Any radionuclide or fissile material different from those authorized for the package design; or

(c) Contents in a form or physical or chemical state, or in a spatial arrangement, different from those authorized for the package design;

as specified in their certificates of approval where appropriate.

4.1.10 Special provisions for mixed packing

4.1.10.1 When mixed packing is permitted in accordance with the provisions of this section, different dangerous goods or dangerous goods and other goods may be packed together in combination packagings conforming to 6.1.4.21, provided that they do not react dangerously with one another and that all other relevant provisions of this Chapter are complied with.

NOTE 1: See also 4.1.1.5 and 4.1.1.6.

2: For goods of Class 7, see 4.1.9.

4.1.10.2 Except for packages containing Class 1 goods only or Class 7 goods only, if wooden or fibreboard boxes are used as outer packagings, a package containing different goods packed together shall not weigh more than 100 kg.

4.1.10.3 Unless otherwise prescribed by a special provision applicable according to 4.1.10.4, dangerous goods of the same class and the same classification code may be packed together.

4.1.10.4 When indicated for a given entry in Column (9b) of Table A of Chapter 3.2, the following special provisions shall apply to the mixed packing of the goods assigned to that entry with other goods in the same package.

MP 1 May only be packed together with goods of the same type within the same compatibility group.

MP 2 Shall not be packed together with other goods.

MP 3 Mixed packing of UN No. 1873 with UN No. 1802 is permitted.

MP 4 Shall not be packed together with goods of other classes or with goods which are not subject to the requirements of RID. However, if this organic peroxide is a hardener or compound system for Class 3 substances, mixed packing is permitted with these substances of Class 3.

MP 5 UN No. 2814 and UN No. 2900 may be packed together in a combination packaging in conformity with P620. They shall not be packed together with other goods; this does not apply to UN No. 3373 Biological substance, Category B packed in accordance with P650 or to substances added as coolants, e.g. ice, dry ice or refrigerated liquid nitrogen.

MP 6 Shall not be packed together with other goods. This does not apply to substances added as coolants, e.g. ice, dry ice or refrigerated liquid nitrogen.

MP 7 May – in quantities not exceeding 5 litres per inner packaging – be packed together in a combination packaging conforming to 6.1.4.21:

– with goods of the same class covered by other classification codes when mixed packing is also permitted for these; or

– with goods which are not subject to the requirements of RID,

provided they do not react dangerously with one another.

MP 8 May – in quantities not exceeding 3 litres per inner packaging – be packed together in a combination packaging conforming to 6.1.4.21:

– with goods of the same class covered by other classification codes when mixed packing is also permitted for these; or

– with goods which are not subject to the requirements of RID,

provided they do not react dangerously with one another.

MP 9 May be packed together in an outer packaging for combination packagings in accordance with 6.1.4.21:

– with other goods of Class 2;

– with goods of other classes, when the mixed packing is also permitted for these; or

– with goods which are not subject to the requirements of RID,

provided they do not react dangerously with one another.

MP 10 May – in quantities not exceeding 5 kg per inner packaging – be packed together in a combination packaging conforming to 6.1.4.21:

– with goods of the same class covered by other classification codes or with goods of other classes, when mixed packing is also permitted for these; or

– with goods which are not subject to the requirements of RID,

provided they do not react dangerously with one another.

MP 11 May – in quantities not exceeding 5 kg per inner packaging – be packed together in a combination packaging conforming to 6.1.4.21:

– with goods of the same class covered by other classification codes or with goods of other classes (except substances of packing group I or II of Class 5.1) when mixed packing is also permitted for these; or

– with goods which are not subject to the requirements of RID,

provided they do not react dangerously with one another.

MP 12 May – in quantities not exceeding 5 kg per inner packaging – be packed together in a combination packaging conforming to 6.1.4.21:

– with goods of the same class covered by other classification codes or with goods of other classes (except substances of packing group I or II of Class 5.1) when mixed packing is also permitted for these; or

– with goods which are not subject to the requirements of RID,

provided they do not react dangerously with one another.

Packagings shall not weigh more than 45 kg. If fibreboard boxes are used as outer packagings however, a package shall not weigh more than 27 kg.

MP 13 May – in quantities not exceeding 3 kg per inner packaging and per package – be packed together in a combination packaging conforming to 6.1.4.21:

– with goods of the same class covered by other classification codes or with goods of other classes, when mixed packing is also permitted for these; or

– with goods which are not subject to the requirements of RID,

provided they do not react dangerously with one another.

MP 14 May – in quantities not exceeding 6 kg per inner packaging – be packed together in a combination packaging conforming to 6.1.4.21:

– with goods of the same class covered by other classification codes or with goods of other classes, when mixed packing is also permitted for these; or

– with goods which are not subject to the requirements of RID,

provided they do not react dangerously with one another.

MP 15 May – in quantities not exceeding 3 litres per inner packaging – be packed together in a combination packaging conforming to 6.1.4.21:

– with goods of the same class covered by other classification codes or with goods of other classes, when mixed packing is also permitted for these; or

– with goods which are not subject to the requirements of RID,

provided they do not react dangerously with one another.

MP 16 May – in quantities not exceeding 3 litres per inner packaging and per package – be packed together in a combination packaging conforming to 6.1.4.21:

– with goods of the same class covered by other classification codes or with goods of other classes, when mixed packing is also permitted for these; or

– with goods which are not subject to the requirements of RID,

provided they do not react dangerously with one another.

MP 17 May – in quantities not exceeding 0.5 litre per inner packaging and 1 litre per package – be packed together in a combination packaging conforming to 6.1.4.21:

– with goods of other classes, except Class 7, when mixed packing is also permitted for these; or

– with goods which are not subject to the requirements of RID,

provided they do not react dangerously with one another.

MP 18 May – in quantities not exceeding 0.5 kg per inner packaging and 1 kg per package – be packed together in a combination packaging conforming to 6.1.4.21:

– with goods or articles of other classes, except Class 7, when mixed packing is also permitted for these; or

– with goods which are not subject to the requirements of RID,

provided they do not react dangerously with one another.

MP 19 May – in quantities not exceeding 5 litres per inner packaging – be packed together in a combination packaging conforming to 6.1.4.21:

– with goods of the same class covered by other classification codes or with goods of other classes, when mixed packing is also permitted for these; or

– with goods which are not subject to the requirements of RID, provided they do not react dangerously with one another.

MP 20 May be packed together with substances covered by the same UN number.

Shall not be packed together with goods and articles of Class 1 having different UN numbers, except if provided for by special provision MP 24.

Shall not be packed together with goods of other classes or with goods which are not subject to the requirements of RID.

MP 21 May be packed together with articles covered by the same UN number.

Shall not be packed together with goods of Class 1 having different UN numbers, except for

(a) their own means of initiation, provided that

(i) the means of initiation will not function under normal conditions of carriage; or

(ii) such means have at least two effective protective features which prevent explosion of an article in the event of accidental functioning of the means of initiation; or

(iii) when such means do not have two effective protective features (i.e. means of initiation assigned to compatibility group B), in the opinion of the competent authority of the country of origin[4] the accidental functioning of the means of initiation does not cause the explosion of an article under normal conditions of carriage;

(b) articles of compatibility groups C, D and E.

Shall not be packed together with goods of other classes or with goods which are not subject to the requirements of RID.

When goods are packed together in accordance with this special provision, account shall be taken of a possible amendment of the classification of packages in accordance with 2.2.1.1.

For the description of the goods in the transport document, see 5.4.1.2.1 (b).

MP 22 May be packed together with articles covered by the same UN number.

Shall not be packed together with goods of Class 1 having different UN numbers, except

(a) With their own means of initiation, provided that the means of initiation will not function under normal conditions of carriage; or

(b) With articles of compatibility groups C, D and E; or

(c) If provided for by special provision MP 24.

Shall not be packed together with goods of other classes or with goods which are not subject to the requirements of RID.

When goods are packed together in accordance with this special provision, account shall be taken of a possible amendment of the classification of packages in accordance with 2.2.1.1.

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[4] If the country of origin is not a COTIF Member State, the approval shall require validation by the competent authority of the first COTIF Member State reached by the consignment.

For the description of the goods in the transport document, see 5.4.1.2.1 (b).

MP 23 May be packed together with articles covered by the same UN number.

Shall not be packed together with goods and articles of Class 1 having different UN numbers, except

(a) With their own means of initiation, provided that the means of initiation will not function under normal conditions of carriage; or

(b) If provided for by special provision MP 24.

Shall not be packed together with goods of other classes or with goods which are not subject to the requirements of RID.

When goods are packed together in accordance with this special provision, account shall be taken of a possible amendment of the classification of packages in accordance with 2.2.1.1.

For the description of the goods in the transport document, see 5.4.1.2.1 (b).

MP 24 May be packed together with goods with the UN numbers shown in the table below, under the following conditions:

– if a letter A is indicated in the table, the goods with those UN numbers may be included in the same package without any special limitation of mass;

– if a letter B is indicated in the table, the goods with those UN numbers may be included in the same package up to a total mass of 50 kg of explosive substances.

When goods are packed together in accordance with this special provision, account shall be taken of a possible amendment of the classification of packages in accordance with 2.2.1.1.

For the description of the goods in the transport document, see 5.4.1.2.1 (b).

UN No.	0012	0014	0027	0028	0044	0054	0160	0161	0186	0191	0194	0195	0197	0238	0240	0312	0333	0334	0335	0336	0337	0373	0405	0428	0429	0430	0431	0432	0505	0506	0507
0012		A																													
0014	A																														
0027				B	B		B	B																							
0028			B		B		B	B																							
0044			B	B			B	B																							
0054									B	B	B	B	B	B	B	B						B	B	B	B	B	B	B	B	B	B
0160			B	B	B			B																							
0161			B	B	B		B																								
0186						B				B	B	B	B	B	B	B						B	B	B	B	B	B	B	B	B	B
0191						B			B		B	B	B	B	B	B						B	B	B	B	B	B	B	B	B	B
0194						B			B	B		B	B	B	B	B						B	B	B	B	B	B	B	B	B	B
0195						B			B	B	B		B	B	B	B						B	B	B	B	B	B	B	B	B	B
0197						B			B	B	B	B		B	B	B						B	B	B	B	B	B	B	B	B	B
0238						B			B	B	B	B	B		B	B						B	B	B	B	B	B	B	B	B	B
0240						B			B	B	B	B	B	B		B						B	B	B	B	B	B	B	B	B	B
0312						B			B	B	B	B	B	B	B							B	B	B	B	B	B	B	B	B	B
0333																		A	A	A	A										
0334																	A		A	A	A										
0335																	A	A		A	A										
0336																	A	A	A		A										
0337																	A	A	A	A											
0373						B			B	B	B	B	B	B	B	B							B	B	B	B	B	B	B	B	B
0405						B			B	B	B	B	B	B	B	B						B		B	B	B	B	B	B	B	B
0428						B			B	B	B	B	B	B	B	B						B	B		B	B	B	B	B	B	B
0429						B			B	B	B	B	B	B	B	B						B	B	B		B	B	B	B	B	B
0430						B			B	B	B	B	B	B	B	B						B	B	B	B		B	B	B	B	B
0431						B			B	B	B	B	B	B	B	B						B	B	B	B	B		B	B	B	B
0432						B			B	B	B	B	B	B	B	B						B	B	B	B	B	B		B	B	B
0505						B			B	B	B	B	B	B	B	B						B	B	B	B	B	B	B		B	B
0506						B			B	B	B	B	B	B	B	B						B	B	B	B	B	B	B	B		B
0507						B			B	B	B	B	B	B	B	B						B	B	B	B	B	B	B	B	B	