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(Bern, 28 May – 1 June 2001)

**AMENDMENTS TO CHAPTER 4.1 TO ACCOMMODATE THE PROVISIONS ADOPTED
FOR CLASS 2 RECEPTACLES IN THE UN MODEL REGULATIONS**

Transmitted by the European Industrial Gases Association (EIGA) */

Introduction

Much of the text adopted in the 12th Revision of the UN Model Regulations for the packing provisions for Class 2 receptacles is based upon the RID/ADR. Some changes were made, however, to the structure and content of P200 that includes now three sub-tables (one for the compressed gases, one for the liquefied and dissolved gases and one for substances from other classes that are packed in gas receptacles), and some new provisions have been introduced.

In view of keeping as much as possible the benefit of harmonisation, EIGA proposes to adopt the new structure of P200 and the new requirements except in the cases where they are in conflict with already adopted principles within ADR or RID: e.g. the classification code, or the “non-mandatory” character of the use of EN or ISO standards or the use of “capsules” that is not foreseen in the UN Model regulations.

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EIGA took the opportunity to propose for the carriage in capsules the same limitations as for the aerosols and cartridges: not for pyrophoric gases or toxic gases with a LC₅₀ lower than 200 ppm.

The comments of EIGA to the proposed text are shown in italics. New text proposed by EIGA is underlined.

Proposals

Amend Chapter 4.1 as follows

Proposal 1: Replace the existing P200 with the following:

P200	PACKING INSTRUCTION	P200
<p>Type of packagings: Cylinder, tubes, pressure drums and bundles of cylinders</p> <p>Cylinder, 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): <i>(present ADR text)</i></p> <p>For pressure receptacles, the general packing requirements of 4.1.6.1 shall be met. In addition, for MEGCs, the general requirements of 4.2.4 shall be met.</p> <p>Cylinders, tubes, pressure drums, bundles of cylinders constructed as specified in 6.2 and MEGCs constructed as specified in 6.7.5 are authorised for the transport of a specific substance when specified in the following tables. For some substances the special packing provisions may prohibit a particular type of cylinder, tube, pressure drum or bundle of cylinders. (new UN text redundant with present ADR/RID text; the reference to the construction requirements appear in 4.1.6 and should not be repeated here; the reference to MEGC's is redundant as well, 4.2 and 4.3 will refer to P200 for the filling of the elements.)</p> <p>General</p> <p>(1) Receptacles shall be so closed and leakproof as to prevent escape of the gases; <i>(present ADR text)</i></p> <p>(2) Pressure receptacles containing toxic substances with an LC₅₀ less than or equal to 200 ml/m³ (ppm) as specified in the table shall not be equipped with any pressure relief device <i>(new text of UN; additional requirements on pressure relief devices for UN approved pressure receptacles have been introduced in 6.2.5.1);</i></p> <p>(3) <i>(new UN text that replaces existing ADR/RID paragraphs (10) and (11))</i> 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:</p> <ul style="list-style-type: none"> (a) the UN number, name and description, and classification of the substance; (b) the LC₅₀ 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; (e) the minimum test pressure of the pressure receptacles; (f) the maximum working pressure of the pressure receptacles for compressed gases (where no value is given, the working pressure shall not exceed two thirds of the test pressure) or the maximum filling ratio(s) dependent on the test pressure(s) for liquefied and dissolved gases; <i>(crossed out text is redundant with following paragraphs or wrong -for low pressure liquefied gases, the filling ratio is not related to the test pressure)</i> (g) special packing provisions that are specific to a substance. 		

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PACKING INSTRUCTION (cont'd)

P200

Test pressure and filling ratios

(4) The minimum test pressure required for is 1 MPa (10 bar); *(present ADR text, to be kept, essential requirement)*

(5) *(new UN text that replaces existing ADR/RID texts of (3), (4), (5) and (6))* 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 provided that the above criterion is met, except where special packing provision "o" applies.

For high pressure liquefied gases for which data is not provided in the table, the maximum filling ratio (FR) shall be determined as follows:

$$FR = 8.5 H 10^{-4} H d_g H P_h$$

where FR = maximum filling ratio
 d_g = gas density (at 15 °C, 1 bar)(in g/l)
 P_h = minimum test pressure (in bar)

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

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

where FR = maximum filling ratio
 P_h = minimum test pressure (in bar)
 MM = molecular mass (in g/mol)
 R = 8.31451×10^{-2} bar.l/mol.K (gas constant)

For gas mixtures, the average molecular mass is to be taken, taking into account the volumetric concentrations of the various components.

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

For low pressure liquefied gases for which filling data is not provided in the table, the maximum filling ratio shall be determined as follows:

$$FR = (0.0032 H BP - 0.24) H d_l$$

where FR = maximum filling ratio
 BP = boiling point (in Kelvin)
 d_l = density of the liquid at boiling point (in kg/l)

P200	PACKING INSTRUCTION (cont'd)	P200
	<p>(d) For UN 1001, acetylene, dissolved, and UN 3374 acetylene, solvent free, see (9), special packing provision p.</p> <p>(6) Other test pressure and degree of filling may be used provided they satisfy the general requirements outlined in the previous paragraphs of this section;</p> <p>Periodic inspections</p> <p>(7) Refillable receptacles shall be subjected to periodic inspections in accordance with the provisions of 6.2.1.6.</p> <p>(8) If special requirements for certain substances do not appear in the table below, periodic inspections shall be carried out: <i>(essential requirement, existing text of ADR/RID modified in (a) and (b))</i></p> <p>(a) <u>Every 5 years in the case of 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 4C;</u></p> <p>(b) <u>Every 5 years in the case of receptacles intended for the carriage of substances from other classes;</u></p> <p>(c) Every 10 years in the case of receptacles intended for the carriage of gases of classification codes 1A, 1O, 1F, 2A, 2O and 2F.</p> <p>By derogation from this paragraph, the periodic inspection of receptacles which make use of composite materials (composite receptacles) shall be carried out at intervals determined by the competent authority of the Contracting Party to ADR (RID) which has approved the technical code for the design and construction. <i>(present ADR/RID text)</i></p>	
	<p>Special packing provisions</p> <p>(9) Keys for the column "Special packing provisions": <i>(new UN text to replace (12))</i></p> <p>Material compatibility (for gases see EN ISO 11114-1:1997 and EN ISO 11114-2:2000)</p> <p>a: Aluminium alloy pressure receptacles are not authorized.</p> <p>b: Copper valves shall not be used.</p> <p>c: Metal parts in contact with the contents shall not contain more than 65% copper <i>(70% in present ADR/RID)</i>.</p> <p>d: When steel pressure receptacles are used, only those resistant to hydrogen embrittlement shall be authorized. <i>(new text)</i></p> <p>Requirements for toxic substances with an LC₅₀ less than or equal to 200 ml/m³ (ppm)</p> <p>k: Valve outlets shall be fitted with gas tight plugs or caps <u>which shall be made of material not liable to attack by the contents of the receptacle.</u> <i>(text transferred from ADR 4.1.6.5)</i></p> <p>Each cylinder within a bundle shall be fitted with an individual valve that shall be closed during transport. After filling, the manifold shall be evacuated, purged and plugged. <i>(second sentence is new UN text)</i></p>	

P200	PACKING INSTRUCTION (cont'd)	P200
<p>The pressure receptacle(s) shall: <i>(new UN requirement):</i></p> <ul style="list-style-type: none">(i) 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; or(ii) have an outer packaging meeting the packing group I performance level; or(iii) <u>be carried in a metallic, wooden or strong plastic box</u> <i>(new text proposed by EIGA)</i> <p>Pressure receptacles shall not be fitted with a pressure relief device. <i>(new UN text, but redundant with (2))</i></p> <p>Cylinders and individual cylinders in a bundle shall be limited to a maximum water capacity of 85 litres. <i>(new UN text)</i></p> <p>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. <i>(new UN text)</i></p> <p>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. <i>(new UN text)</i></p> <p><u>Carriage in capsules is not allowed</u> <i>(new text proposed by EIGA):</i></p> <p>Each pressure receptacle shall be tested for leakage after filling. <i>(new UN text)</i></p>		
<p>Gas specific provisions</p> <ul style="list-style-type: none">l: UN 1040 ethylene oxide may also be packed in hermetically sealed glass or metal inner packagings suitably cushioned in fibreboard, wooden or metal boxes meeting the packing group I performance level. The maximum quantity permitted in any glass inner packaging is 30 g, and the maximum quantity permitted in any metal inner packaging is 200 g. After filling, each inner packaging shall be determined to be 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 total quantity in any outer packaging shall not exceed 2.5 kg. <i>(new UN text)</i>m: Pressure receptacles shall be filled to a working pressure not exceeding 5 bar. <i>(new text, applies to UN 1081 tetrafluoroethylene reflecting the existing ADR restriction)</i>n: A pressure receptacle shall contain not more than 5 kg of the gas.o: In no case shall the working pressure or filling ratio shown in the table be exceeded. <i>(new text for F2, NO, F2O, diborane and tetrafluoroethylene)</i>p: For UN 1001 acetylene, dissolved, and UN 3374 acetylene, solvent free: cylinders shall be filled with a homogeneous monolithic porous mass; 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. <i>(last part of UN text crossed out because in ADR/RID, D/A cylinders are always subject to approval)</i> <p>For UN 1001 acetylene, dissolved, cylinders shall contain a quantity of acetone or suitable solvent as specified in the approval (see ISO 3807 1:2000 or ISO 3807 2:2000, as</p>		

P200	PACKING INSTRUCTION (cont'd)	P200
	<p>applicable; <i>crossed out see previous remark</i>); cylinders fitted with pressure relief devices or manifolded together shall be transported vertically.</p> <p>The test pressure of 52 bar applies only to cylinders conforming to ISO 3807 2:2000. (UN text crossed out because US only)</p> <p>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 <u>which shall be made of material not liable to attack by the contents of the receptacle. (new text transferred from ADR 4.1.6.5).</u> When these pressure receptacles are manifolded in a bundle, each of the pressure receptacles shall be fitted with an individual valve that shall be closed during transport, and the manifold outlet valve shall be fitted with a gas-tight plug or cap. <u>Carriage in capsules is not allowed (last sentence is new text proposed by EIGA):</u></p> <p>r: <i>(add the existing special requirement “n” for capsules modified as follows and to be applied accordingly, the restriction on capsules appear under k and q)</i> allowed for carriage in capsules under the following conditions:</p> <p>(a) The mass of gas shall not exceed 150 g per capsule;</p> <p>(b) The capsules shall be free from faults liable to impair the strength;</p> <p>(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;</p> <p>(d) The capsules shall be placed in an outer packaging of sufficient strength. A package shall not weigh more than 75 kg.</p> <p>s: Aluminium alloy pressure receptacles shall be:</p> <ul style="list-style-type: none"> - Equipped only with brass or stainless steel valves; and - Cleaned for hydrocarbons contamination <i>(instead of “in accordance with ISO 11621:1997 and not contaminated with oil” as in UN text that makes ISO standard mandatory).</i> <p>Periodic inspection</p> <p>u: The interval between periodic tests may be extended to 10 years for aluminium alloy pressure receptacles when the alloy of the pressure receptacle has been subjected to stress corrosion testing as specified in ISO 7866:1999. (deleted to be in line with existing ADR/RID text and because it would restrict to new receptacles)</p> <p>v: The interval between inspections for steel cylinders may be extended to 15 years:</p> <p>(a) with the agreement of the competent authority (authorities) of the country (countries) where the periodic inspection and the carriage take place;</p> <p>(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”. <i>(existing ADR/RID text of “m”)</i></p> <p>(10) The applicable requirements of this packing instruction are considered to have been complied with if the following standards, as relevant, are applied:</p>	
Applicable requirements	Reference	Title of document
P200 (9) (p)	EN1801: 1998	Transportable gas cylinders – Filling conditions for single acetylene cylinders (including list of permissible porous masses)
P200 (9) (p)	EN 12755: 2000	Transportable gas cylinders – Filling conditions for acetylene bundles

The column for the MEGC has been deleted; the allowance to transport in MEGC or in battery-vehicles is given by the tank code in columns 10 or 12 of Chapter 3.2

P200 PACKING INSTRUCTION (cont'd) P200											
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	Test pressure, bar ¹	Working pressure, bar ¹	Special packing provisions
1002	AIR, COMPRESSED	1A		X	X	X	X	10			
1006	ARGON, COMPRESSED	1A		X	X	X	X	10			
1014	CARBON DIOXIDE AND OXYGEN MIXTURE, COMPRESSED	1O		X	X	X	X	10			
1016	CARBON MONOXIDE, COMPRESSED	1TF	376 0	X	X	X	X	5			u
1023	COAL GAS, COMPRESSED	1TF		X	X	X	X	5			
1045	FLUORINE, COMPRESSED	1TO C	185	X			X	5	200	30	a, k, n, o
1046	HELIUM, COMPRESSED	1A		X	X	X	X	10			
1049	HYDROGEN, COMPRESSED	1F		X	X	X	X	10			d
1056	KRYPTON, COMPRESSED	1A		X	X	X	X	10			
1065	NEON, COMPRESSED	1A		X	X	X	X	10			
1066	NITROGEN, COMPRESSED	1A		X	X	X	X	10			
1071	OIL GAS, COMPRESSED	1TF		X	X	X	X	5			
1072	OXYGEN, COMPRESSED	1O		X	X	X	X	10			s
1612	HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE	1T		X	X	X	X	5			z
1660	NITRIC OXIDE, COMPRESSED	1TO C	115	X			X	5	200	50	k, o
1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.	1TF		X	X	X	X	5			z
1954	COMPRESSED GAS, FLAMMABLE, N.O.S	1F		X	X	X	X	10			z
1955	COMPRESSED GAS, TOXIC, N.O.S.	1T		X	X	X	X	5			z
1956	COMPRESSED GAS, N.O.S.	1A		X	X	X	X	10			z
1957	DEUTERIUM, COMPRESSED	1F		X	X	X	X	10			d
1964	HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S	1F		X	X	X	X	10			z

¹ Where the entries are blank, the working pressure shall not exceed two thirds of the test pressure.

P200		PACKING INSTRUCTION (cont'd)										P200
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	Test pressure, bar ¹	Working pressure, bar ¹	Special packing provisions	
1971	METHANE, COMPRESSED or NATURAL GAS, COMPRESSED with high methane content	1F		X	X	X	X	10				
1979	RARE GASES MIXTURE, COMPRESSED	1A		X	X	X	X	10				
1980	RARE GASES AND OXYGEN MIXTURE, COMPRESSED	1A		X	X	X	X	10				
1981	RARE GASES AND NITROGEN MIXTURE, COMPRESSED	1A		X	X	X	X	10				
2034	HYDROGEN AND METHANE MIXTURE, COMPRESSED	1F		X	X	X	X	10			d	
2190	OXYGEN DIFLUORIDE, COMPRESSED	1TO C	2.6	X			X	5	200	30	a, k, n, o	
2600	CARBON MONOXIDE AND HYDROGEN MIXTURE, COMPRESSED	1TF		X	X	X	X	5			d, u	
3156	COMPRESSED GAS, OXIDIZING, N.O.S.	1O		X	X	X	X	10			z	
3303	COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S.	1TO		X	X	X	X	5			z	
3304	COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.	1TC		X	X	X	X	5			z	
3305	COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	1TF C		X	X	X	X	5			z	
3306	COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	1TO C		X	X	X	X	5			z	

P200		PACKING INSTRUCTION (cont'd)									P200
Table 2: LIQUEFIED GASES AND DISSOLVED GASES											
UN No.	Name and description	Classification code	LC ₅₀ ml/m ³	Cylinders	Pressure drums	Bundles of cylinders	Tubes	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions
1001	ACETYLENE, DISSOLVED	4F		X		X		10	60		c, p
1005	AMMONIA, ANHYDROUS	2TC	4000	X	X	X	X	5	33	0.53	b
1008	BORON TRIFLUORIDE	2TC	387*	X	X	X	X	5	225 300	0.715 0.86	
1009	BROMOTRIFLUOROMETHANE (REFRIGERANT GAS R 13B1)	2A		X	X	X	X	10	42 120 250	1.13 1.44 1.60	
1010	BUTADIENES, STABILIZED (1,2-butadiene), or	2F		X	X	X	X	10	10	0.59	
1010	BUTADIENES, STABILIZED (1,3-butadiene), or	2F		X	X	X	X	10	10	0.55	
1010	BUTADIENES, STABILIZED (mixtures of 1,3-butadiene and hydrocarbons)	2F		X	X	X	X	10	10	0.50	z
1011	BUTANE	2F		X	X	X	X	10	10	0.51	v
1012	BUTYLENE (butylenes mixture) or	2F		X	X	X	X	10	10	0.50	z
1012	BUTYLENE (1-butylene) or	2F		X	X	X	X	10	10	0.53	
1012	BUTYLENE (cis-2-butylene) or	2F		X	X	X	X	10	10	0.55	
1012	BUTYLENE (trans-2-butylene)	2F		X	X	X	X	10	10	0.54	
1013	CARBON DIOXIDE	2A		X	X	X	X	10	190 250	0.66 0.75	
1015	CARBON DIOXIDE AND NITROUS OXIDE MIXTURE	2A		X	X	X	X	10	250	0.75	
1017	CHLORINE	2TC	293	X	X	X	X	5	22	1.25	a
1018	CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22)	2A		X	X	X	X	10	29	1.03	
1020	CHLOROPENTAFLUOROETHANE (REFRIGERANT GAS R 115)	2A		X	X	X	X	10	25	1.08	
1021	1-CHLORO-1,2,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 124)	2A		X	X	X	X	10	12	1.20	

* This LC₅₀ value is under review.

P200		PACKING INSTRUCTION (cont'd)									P200
Table 2: LIQUEFIED GASES AND DISSOLVED GASES											
UN No.	Name and description	Classification code	LC ₅₀ ml/m ³	Cylinders	Pressure drums	Bundles of cylinders	Tubes	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions
1022	CHLOROTRIFLUOROMETHANE (REFRIGERANT GAS R 13)	2A		X	X	X	X	10	100 120 190 250	0.83 0.90 1.04 1.10	
1026	CYANOGEN	2TF	350	X	X	X	X	5	100	0.70	u
1027	CYCLOPROPANE	2F		X	X	X	X	10	20	0.53	
1028	DICHLORODIFLUOROMETHANE (REFRIGERANT GAS R 12)	2A		X	X	X	X	10	18	1.15	
1029	DICHLOROFLUOROMETHANE (REFRIGERANT GAS R 21)	2A		X	X	X	X	10	10	1.23	
1030	1,1-DIFLUOROETHANE (REFRIGERANT GAS R 152a)	2A		X	X	X	X	10	18	0.79	
1032	DIMETHYLAMINE, ANHYDROUS	2F		X	X	X	X	10	10	0.59	b
1033	DIMETHYL ETHER	2F		X	X	X	X	10	18	0.58	
1035	ETHANE	2F		X	X	X	X	10	95 120 300	0.25 0.29 0.39	
1036	ETHYLAMINE	2F		X	X	X	X	10	10	0.61	b
1037	ETHYL CHLORIDE	2F		X	X	X	X	10	10	0.80	a
1039	ETHYL METHYL ETHER	2F		X	X	X	X	10	10	0.64	
1040	ETHYLENE OXIDE, or ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1MPa (10 bar) at 50 °C	2TF	2900*	X	X	X	X	5	15	0.78	l
1041	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 9% ethylene oxide but not more than 87%	2F		X	X	X	X	10	190 250	0.66 0.75	
1043	FERTILIZER AMMONIATING SOLUTION with free ammonia	CARRIAGE PROHIBITED									

P200 PACKING INSTRUCTION (cont'd) P200											
Table 2: LIQUEFIED GASES AND DISSOLVED GASES											
UN No.	Name and description	Classification code	LC ₅₀ ml/m ³	Cylinders	Pressure drums	Bundles of cylinders	Tubes	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions
1048	HYDROGEN BROMIDE, ANHYDROUS	2TC	2860	X	X	X	X	5	60	1.54	a, d
1050	HYDROGEN CHLORIDE, ANHYDROUS	2TC	2810*	X	X	X	X	5	100 120 150 200	0.30 0.56 0.67 0.74	a, d a, d a, d a, d
1053	HYDROGEN SULPHIDE	2TF	712	X	X	X	X	5	55	0.67	d, u
1055	ISOBUTYLENE	2F		X	X	X	X	10	10	0.52	
1058	LIQUEFIED GASES, non-flammable, charged with nitrogen, carbon dioxide or air	2A		X	X	X	X	10	Test pressure = 1.5 x working pressure		
1060	METHYLACETYLENE AND PROPADIENE MIXTURE, STABILIZED or METHYLACETYLENE AND PROPADIENE MIXTURE, STABILIZED (Propadiene with 1% to 4% methylacetylene)	2F 2F		X X	X X	X X	X X	10 10		0.52	c, z c
1061	METHYLAMINE, ANHYDROUS	2F		X	X	X	X	10	13	0.58	b
1062	METHYL BROMIDE	2T	850	X	X	X	X	5	10	1.51	a
1063	METHYL CHLORIDE (REFRIGERANT GAS R 40)	2F		X	X	X	X	10	17	0.81	a
1064	METHYL MERCAPTAN	2TF	1350	X	X	X	X	5	10	0.78	d, u
1067	DINITROGEN TETROXIDE (NITROGEN DIOXIDE)	2TO C	115	X		X		5	10	1.30	k
1069	NITROSYL CHLORIDE	2TC	35	X		X		5	13	1.10	k
1070	NITROUS OXIDE	2O		X	X	X	X	10	180 225 250	0.68 0.74 0.75	
1075	PETROLEUM GASES, LIQUEFIED	2F		X	X	X	X	10			v, z
1076	PHOSGENE	2TC	5	X	X	X		5	20	1.23	k
1077	PROPYLENE	2F		X	X	X	X	10	30	0.43	
1078	REFRIGERANT GAS, N.O.S.	2A		X	X	X	X	10			z

* This LC₅₀ value is under review.

P200		PACKING INSTRUCTION (cont'd)									P200
Table 2: LIQUEFIED GASES AND DISSOLVED GASES											
UN No.	Name and description	Classification code	LC ₅₀ ml/m ³	Cylinders	Pressure drums	Bundles of cylinders	Tubes	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions
1079	SULPHUR DIOXIDE	2TC	2520	X	X	X	X	5	14	1.23	
1080	SULPHUR HEXAFLUORIDE	2A		X	X	X	X	10	70 140 160	1.04 1.33 1.37	
1081	TETRAFLUOROETHYLENE, STABILIZED	2F		X	X	X	X	10	200		m, o
1082	TRIFLUOROCHLOROETHYLENE, STABILIZED	2TF	2000	X	X	X	X	5	19	1.13	u
1083	TRIMETHYLAMINE, ANHYDROUS	2F		X	X	X	X	10	10	0.56	b
1085	VINYL BROMIDE, STABILIZED	2F		X	X	X	X	10	10	1.37	a
1086	VINYL CHLORIDE, STABILIZED	2F		X	X	X	X	10	12	0.81	a
1087	VINYL METHYL ETHER, STABILIZED	2F		X	X	X	X	10	10	0.67	
1581	CHLOROPICRIN AND METHYL BROMIDE MIXTURE	2T	850	X	X	X	X	5	10	1.51	a
1582	CHLOROPICRIN AND METHYL CHLORIDE MIXTURE	2T	*	X	X	X	X	5	17	0.81	a
1589	CYANOGEN CHLORIDE, STABILIZED	2TC	80	X		X		5	20	1.03	k
1741	BORON TRICHLORIDE	2TC	2541	X	X	X	X	5	10	1.19	
1749	CHLORINE TRIFLUORIDE	2TO C	299	X	X	X	X	5	30	1.40	a
1858	HEXAFLUOROPROPYLENE (REFRIGERANT GAS R 1216)	2A		X	X	X	X	10	22	1.11	
1859	SILICON TETRAFLUORIDE	2TC	450	X	X	X	X	5	200 300	0.74 1.10	
1860	VINYL FLUORIDE, STABILIZED	2F		X	X	X	X	10	250	0.64	a
1911	DIBORANE	2TF	80	X		X		5	250	0.07	d, k, o
1912	METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	2F		X	X	X	X	10	17	0.81	a

* This LC₅₀ value is under review.

P200 PACKING INSTRUCTION (cont'd) P200											
Table 2: LIQUEFIED GASES AND DISSOLVED GASES											
UN No.	Name and description	Classification code	LC ₅₀ ml/m ³	Cylinders	Pressure drums	Bundles of cylinders	Tubes	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions
1952	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with not more than 9% ethylene oxide	2A		X	X	X	X	10	190 250	0.66 0.75	
1958	1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 114)	2A		X	X	X	X	10	10	1.30	
1959	1,1-DIFLUOROETHYLENE (REFRIGERANT GAS R 1132a)	2F		X	X	X	X	10	250	0.77	
1962	ETHYLENE	2F		X	X	X	X	10	225 300	0.34 0.37	
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.	2F		X	X	X	X	10			v, z
1967	INSECTICIDE GAS, TOXIC, N.O.S.	2T		X	X	X	X	5			z
1968	INSECTICIDE GAS, N.O.S.	2A		X	X	X	X	10			z
1969	ISOBUTANE	2F		X	X	X	X	10	10	0.49	v
1973	CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE with fixed boiling point, with approximately 49% chlorodifluoromethane (REFRIGERANT GAS R 502)	2A		X	X	X	X	10	31	1.05	
1974	CHLORODIFLUOROBROMO-METHANE (REFRIGERANT GAS R 12B1)	2A		X	X	X	X	10	10	1.61	
1975	NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURE (NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURE)	2TO C	115	X	X	X		5			k, z
1976	OCTAFLUOROCYCLOBUTANE (REFRIGERANT GAS RC 318)	2.A		X	X	X	X	10	11	1.34	
1978	PROPANE	2F		X	X	X	X	10	25	0.42	v
1982	TETRAFLUOROMETHANE (REFRIGERANT GAS R 14)	2A		X	X	X	X	10	200 300	0.62 0.94	

P200		PACKING INSTRUCTION (cont'd)									P200
Table 2: LIQUEFIED GASES AND DISSOLVED GASES											
UN No.	Name and description	Classification code	LC ₅₀ ml/m ³	Cylinders	Pressure drums	Bundles of cylinders	Tubes	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions
1983	1-CHLORO-2,2,2-TRIFLUOROETHANE (REFRIGERANT GAS R 133a)	2A		X	X	X	X	10	10	1.18	
1984	TRIFLUOROMETHANE (REFRIGERANT GAS R 23)	2A		X	X	X	X	10	190 250	0.87 0.95	
2035	1,1,1-TRIFLUOROETHANE (REFRIGERANT GAS R 143a)	2F		X	X	X	X	10	35	0.75	
2036	XENON	2A		X	X	X	X	10	130	1.24	
2044	2,2-DIMETHYLPROPANE	2F		X	X	X	X	10	10	0.53	
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	4A		X X	X X	X X	X X	5 5	10 12	0.80 0.77	b b
2188	ARSINE	2TF	20	X		X		5	42	1.10	d, k
2189	DICHLOROSILANE	2TF C	314	X	X	X	X	5	10	0.90	
2191	SULPHURYL FLUORIDE	2T	3020	X	X	X	X	5	50	1.10	u
2192	GERMANE	2TF	620*	X	X	X	X	5	250	1.02	d
2193	HEXAFLUOROETHANE (REFRIGERANT GAS R 116)	2A		X	X	X	X	10	200	1.10	
2194	SELENIUM HEXAFLUORIDE	2TC	50	X		X		5	36	1.46	k
2195	TELLURIUM HEXAFLUORIDE	2TC	25	X		X		5	20	1.00	k
2196	TUNGSTEN HEXAFLUORIDE	2TC	160*	X		X		5	10	2.70	a, k
2197	HYDROGEN IODIDE, ANHYDROUS	2TC	2860	X	X	X	X	5	23	2.25	a, d
2198	PHOSPHORUS PENTAFLUORIDE	2TC	190*	X		X		5	200 300	0.90 1.34	k k
2199	PHOSPHINE	2TF	20	X		X		5	225 250	0.30 0.45	d, k d, k
2200	PROPADIENE, STABILIZED	2F		X	X	X	X	10	22	0.50	
2202	HYDROGEN SELENIDE, ANHYDROUS	2TF	2	X		X		5	31	1.60	k

P200 PACKING INSTRUCTION (cont'd) P200											
Table 2: LIQUEFIED GASES AND DISSOLVED GASES											
UN No.	Name and description	Classification code	LC ₅₀ ml/m ³	Cylinders	Pressure drums	Bundles of cylinders	Tubes	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions
2203	SILANE	2F		X	X	X	X	10	225 250	0.32 0.36	d, q d, q
2204	CARBONYL SULPHIDE	2TF	1700	X	X	X	X	5	26	0.84	u
2417	CARBONYL FLUORIDE	2TC	360	X	X	X	X	5	200 300	0.47 0.70	
2418	SULPHUR TETRAFLUORIDE	2TC	40	X		X		5	30	0.91	k
2419	BROMOTRIFLUOROETHYLENE	2F		X	X	X	X	10	10	1.19	
2420	HEXAFLUOROACETONE	2TC	470	X	X	X	X	5	22	1.08	
2421	NITROGEN TRIOXIDE	2TO C	CARRIAGE PROHIBITED								
2422	OCTAFLUOROBUT-2-ENE (REFRIGERANT GAS R 1318)	2A		X	X	X	X	10	12	1.34	
2424	OCTAFLUOROPROPANE (REFRIGERANT GAS R 218)	2A		X	X	X	X	10	25	1.09	
2451	NITROGEN TRIFLUORIDE	2O		X	X	X	X	10	200 300	0.50 0.75	
2452	ETHYLACETYLENE, STABILIZED	2F		X	X	X	X	10	10	0.57	c
2453	ETHYL FLUORIDE (REFRIGERANT GAS R 161)	2F		X	X	X	X	10	30	0.57	
2454	METHYL FLUORIDE (REFRIGERANT GAS R 41)	2F		X	X	X	X	10	300	0.36	
2455	METHYL NITRITE	2A	CARRIAGE PROHIBITED								
2517	1-CHLORO-1,1-DIFLUOROETHANE (REFRIGERANT GAS R 142b)	2F		X	X	X	X	10	10	0.99	
2534	METHYLCHLOROSILANE	2TF C	600	X	X	X	X	5			z
2548	CHLORINE PENTAFLUORIDE	2TO C	122	X		X		5	13	1.49	a, k
2599	CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE with approximately 60% chlorotrifluoromethane (REFRIGERANT GAS R 503)	2A		X	X	X	X	10	31 42 100	0.11 0.20 0.66	

P200		PACKING INSTRUCTION (cont'd)									P200
Table 2: LIQUEFIED GASES AND DISSOLVED GASES											
UN No.	Name and description	Classification code	LC ₅₀ ml/m ³	Cylinders	Pressure drums	Bundles of cylinders	Tubes	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions
2601	CYCLOBUTANE	2F		X	X	X	X	10	10	0.63	
2602	DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE with approximately 74% dichlorodifluoromethane (REFRIGERANT GAS R 500)	2A		X	X	X	X	10	22	1.01	
2676	STIBINE	2TF	20	X		X		5	20	1.20	k
2901	BROMINE CHLORIDE	2TO C	290	X	X	X	X	5	10	1.50	a
3057	TRIFLUOROACETYL CHLORIDE	2TC	10*	X	X	X		5	17	1.17	k
3070	ETHYLENE OXIDE AND DICHLORODIFLUOROMETHANE MIXTURE with not more than 12,5% ethylene oxide	2A		X	X	X	X	10	18	1.09	
3083	PERCHLORYL FLUORIDE	2TO	770	X	X	X	X	5	33	1.21	k, u
3153	PERFLUORO(METHYL VINYL ETHER)	2F		X	X	X	X	10	20	0.75	
3154	PERFLUORO(ETHYL VINYL ETHER)	2F		X	X	X	X	10	10	0.98	
3157	LIQUEFIED GAS, OXIDIZING, N.O.S.	2O		X	X	X	X	10			z
3159	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)	2A		X	X	X	X	10	22	1.04	
3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S.	2TF		X	X	X	X	5			z
3161	LIQUEFIED GAS, FLAMMABLE, N.O.S.	2F		X	X	X	X	10			z
3162	LIQUEFIED GAS, TOXIC, N.O.S.	2T		X	X	X	X	5			z
3163	LIQUEFIED GAS, N.O.S.	2A		X	X	X	X	10			z
3220	PENTAFLUOROETHANE (REFRIGERANT GAS R 125)	2A		X	X	X	X	10	49 36	0.95 0.72	
3252	DIFLUOROMETHANE (REFRIGERANT GAS R 32)	2F		X	X	X	X	10	48	0.78	

* This LC₅₀ value is under review.

P200 PACKING INSTRUCTION (cont'd) P200											
Table 2: LIQUEFIED GASES AND DISSOLVED GASES											
UN No.	Name and description	Classification code	LC ₅₀ ml/m ³	Cylinders	Pressure drums	Bundles of cylinders	Tubes	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions
3296	HEPTAFLUOROPROPANE (REFRIGERANT GAS R 227)	2A		X	X	X	X	10	15	1.20	
3297	ETHYLENE OXIDE AND CHLOROTETRAFLUOROETHANE MIXTURE with not more than 8.8% ethylene oxide	2A		X	X	X	X	10	10	1.16	
3298	ETHYLENE OXIDE AND PENTAFLUROETHANE MIXTURE with not more than 7.9% ethylene oxide	2A		X	X	X	X	10	26	1.02	
3299	ETHYLENE OXIDE AND TETRAFLUROETHANE MIXTURE with not more than 5.6% ethylene oxide	2A		X	X	X	X	10	17	1.03	
3300	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 87% ethylene oxide	2TF	More than 2900	X	X	X	X	5	28	0.73	
3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S.	2TO		X	X	X	X	5			z
3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S.	2TC		X	X	X	X	5			z
3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.	2TF C		X	X	X	X	5			z
3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S.	2TO C		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	4TC		X	X	X	X	5			b
3337	REFRIGERANT GAS R 404A	2A		X	X	X	X	10	36	0.82	
3338	REFRIGERANT GAS R 407A	2A		X	X	X	X	10	36	0.94	
3339	REFRIGERANT GAS R 407B	2A		X	X	X	X	10	38	0.93	
3340	REFRIGERANT GAS R 407C	2A		X	X	X	X	10	35	0.95	
3354	INSECTICIDE GAS, FLAMMABLE, N.O.S	2F		X	X	X	X	10			z
3355	INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.	2TF		X	X	X	X	5			z

P200		PACKING INSTRUCTION (cont'd)										P200
Table 2: LIQUEFIED GASES AND DISSOLVED GASES												
UN No.	Name and description	Classification code	LC ₅₀ ml/m ³	Cylinders	Pressure drums	Bundles of cylinders	Tubes	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions	
3374	ACETYLENE, SOLVENT FREE	2F		X		X		5	60		c, p	

The existing notes a, b (with the diagram) and c shall be added here.

P200		PACKING INSTRUCTION (cont'd)										P200
Table 3: SUBSTANCES NOT IN CLASS 2												
UN No.	Name and description	Class or Division	Classification Code	LC ₅₀ ml/m ³	Cylinders	Pressure drums	Bundles of cylinders	Tubes	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions
1051	HYDROGEN CYANIDE, STABILIZED containing less than 3% water	6.1	TF1	140	X		X		5	100	0.55	k
1052	HYDROGEN FLUORIDE, ANHYDROUS	8	CT1	966*	X	X	X		5	10	0.84	
1745	BROMINE PENTAFLUORIDE	5.1	OT C	25*	X		X		5	10	**	k
1746	BROMINE TRIFLUORIDE	5.1	OT C	180	X		X		5	10	**	k
2495	IODINE PENTAFLUORIDE	5.1	OC T	120	X		X		5	10	**	k
2983	ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE, not more than 30% ethylene oxide	3	FT1		X	X	X		5	10		z

(1614 HYDROGEN CYANIDE STABILISED should be re-assigned to P099 in Chapter 3.2)

Proposal 2: Modify 4.1.6 as follows :

Delete 4.1.6.5 (this is covered by special conditions k and q in P200 (9))

Add the new UN text as following paragraphs after existing 4.1.6.6 (renumbered as 4.1.6.5) and renumber existing 4.1.6.7 as 4.1.6.10

4.1.6.6 Non-refillable pressure receptacles shall:

* This LC₅₀ value is under review.

** A minimum ullage of 8% by volume is required.

- (a) be transported in an outer packaging, such as a box, or crate, or in shrink-wrapped trays 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.

4.1.6.7 Pressure 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.

4.1.6.8 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.

4.1.6.9 Charged pressure receptacles shall not be offered for transport;

- (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.".
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